



DUKES COUNTY CONTRIBUTORY RETIREMENT SYSTEM

**ACTUARIAL VALUATION
as of
January 1, 2020**

KMS Actuarial, LLC
52 Hunt Road
Kingston, NH 03848

November, 2020



November 20, 2020

Dukes County Contributory Retirement Board
9 Airport Road
Suite 1
Vineyard Haven, MA 02568

Dear Board Members:

We are pleased to present the enclosed report providing the results of our actuarial valuation of the Dukes County Contributory Retirement System as of January 1, 2020. Our valuation was performed in accordance with the provisions contained in Chapter 32 of the Massachusetts General Laws, "M.G.L.", as of January 1, 2020. Disclosures under GASB Statement No. 67, Financial Reporting for Pension Plans (GASB 67) and GASB Statement No. 68, Accounting and Financial Reporting for Pensions (GASB 68) are provided in a separate report.

The principal results of our valuation are summarized in Section 2. The Summary of Plan Provisions and Actuarial Assumptions and Methods are shown in Sections 5 and 6, respectively. Section 7 summarizes the demographic profile of active members, retired plan members and beneficiaries and disabled plan members. Asset information and actuarial liabilities are presented in Section 2. The development of the required appropriations pursuant to Chapter 32 of the M.G.L. is shown in Section 3, including a 30-year forecast of the required appropriations and projected cash flows. Section 4 includes a summary of valuation information for PERAC as well as information relating to the primary risks to the System and an assessment of those risks.

This valuation is based upon member data provided by the Dukes County Contributory Retirement Board and asset information reported to the Public Employee Retirement Administration Commission (PERAC) by the Retirement Board. Although we did not audit the data used in the valuation, we believe that the information is complete and reliable.

Liabilities presented in this report are based on a long-term investment return rate assumption of 7.5%, net of investment expense, compounded annually.

This report was completed in accordance with generally accepted actuarial standards and procedures, and conforms to the Code of Professional Conduct of the American Academy of Actuaries. The actuarial assumptions used in the determination of costs are reasonably related to the experience of the System and to reasonable expectations, and represent our best estimate of anticipated long-term experience under the System.

K M S A C T U A R I E S

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Future actuarial valuation results may differ significantly from the current results presented in this report. Examples of potential sources of volatility include plan experience differing from that anticipated by the economic or demographic assumptions, the effect of new entrants, changes in economic or demographic assumptions, the effect of law changes and the delayed effect of smoothing techniques.

Our valuation follows generally accepted actuarial methods and we perform such tests as we consider necessary to assure the accuracy of the results. The amounts presented in this report have been appropriately determined according to the actuarial assumptions and methods stated herein.

This report is intended for the sole use of the Dukes County Contributory Retirement Board and is intended to provide information to comply with the stated purpose of the report. It may not be appropriate for other purposes.

The undersigned credentialed actuaries are Members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries necessary to render the actuarial opinion contained herein. They are available to answer any questions with regard to this report.

Respectfully submitted,



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SECTION 1 - EXECUTIVE SUMMARY

Background

We have completed the Actuarial Valuation of the Dukes County Contributory Retirement System as of January 1, 2020. This valuation is based upon census data provided by the Retirement Board and asset information reported to the Public Employee Retirement Administration Commission (PERAC) by the Dukes County Contributory Retirement Board. Information for the prior valuation completed as of January 1, 2018 was obtained from the valuation report prepared by KMS Actuaries, LLC.

Massachusetts General Laws

The valuation was prepared in accordance with Chapter 32 of the Massachusetts General Laws ("M.G.L."). The results are based on the active, inactive and retired members and beneficiaries as of December 31, 2019, the assets as of December 31, 2019 and assumptions regarding investment returns, salary increases, mortality, turnover, disability and retirement.

The valuation does not take into consideration:

- ◆ Changes in the law after the valuation date,
- ◆ Transfers between retirement systems pursuant to Section 3(8)(c) of Chapter 32,
- ◆ State-mandated benefits and
- ◆ Cost-of-living increases granted to members in pay status between 1982 and 1997.

GASB Statement Numbers 67 and 68

In June 2012, the GASB approved two related Statements that significantly changed the way pension plans and governments account and report pension liabilities. Effective for plans with fiscal years beginning after June 15, 2013, GASB Statement No. 67, Financial Reporting for Pension Plans, replaced the requirements of Statement No. 25 and effective for employers with fiscal years beginning after June 15, 2014, GASB Statement No. 68, Accounting and Financial Reporting for Pensions, replaced the requirements of Statement No. 27.

The pension standards reflect changes from those previously in place regarding how governments calculate total pension liability and pension expense. Further, the standards contain requirements for disclosing information in the notes to financial statements and presenting required supplementary information following the notes.

The required disclosures and notes under GASB Statement Number 67 and 68 for the fiscal year ending December 31, 2019 are provided in a separate report.

Assets

This valuation is based upon asset information reported to the Public Employee Retirement Administration Commission (PERAC) by the Dukes County Contributory Retirement Board. The market value of assets increased from \$155,586,109 as of December 31, 2017 to \$186,551,108 as of December 31, 2019. During the plan years ended 2018 and 2019, the market value rates of return were -0.45% and 21.55%, respectively.

The actuarial value of assets increased from \$147,758,673 as of January 1, 2018 to \$173,576,041 as of January 1, 2020. During the plan years ended 2018 and 2019, the rates of return on the actuarial value of assets were 7.07% and 9.05%, respectively.

SECTION 1 - EXECUTIVE SUMMARY

Changes Since the Last Valuation

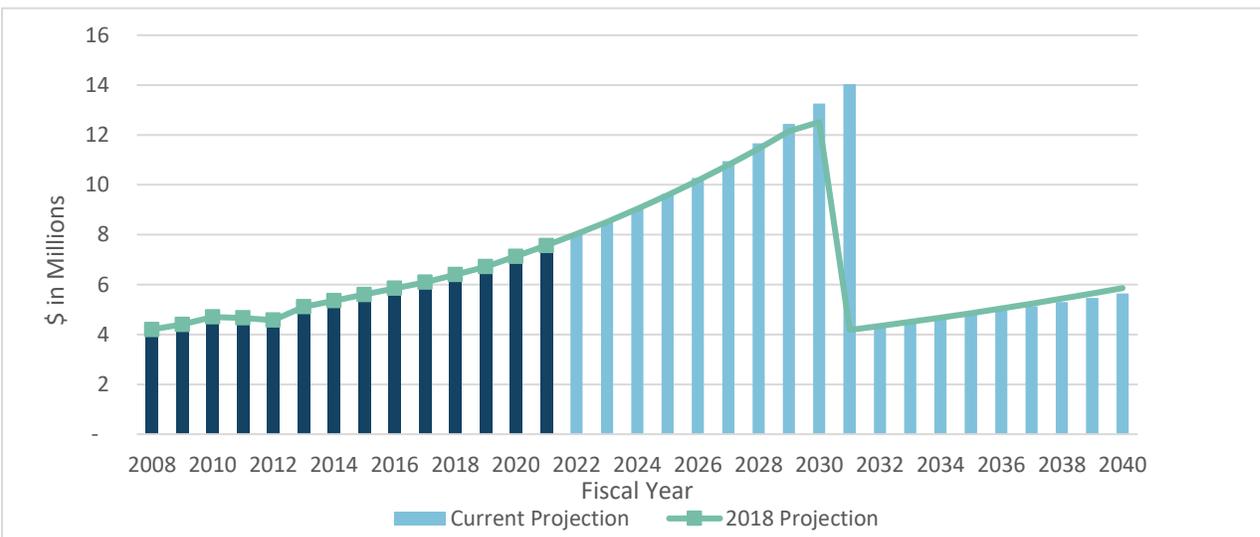
During the two years since the last valuation, the total unfunded actuarial accrued liability of the System was expected to decrease from \$45,712,272 as of January 1, 2018 to \$40,804,363 as of January 1, 2020, for a total decrease of \$4,907,909. The actual unfunded actuarial accrued liability, before any assumption or plan changes, was \$47,569,124, resulting in an actuarial loss of \$6,764,761. The actuarial loss was primarily due to an asset gain of approximately \$1,782,000 and a demographic experience loss of approximately \$8,547,000. The details of the gain and loss analysis are provided in Section 2, Actuarial Experience.

Appropriations

The funding appropriation for each year is computed as the sum of the normal cost, net 3(8)(c) transfers and an amortization payment to pay off the Unfunded Actuarial Liability, adjusted for semi-annual payments of the appropriation made July 1 and January 1. The appropriation calculated as of the January 1, 2020 valuation is \$8,163,454, and is made up of a normal cost payment of \$2,582,884, net 3(8)(c) transfers of \$378,944, and an amortization payment of \$5,201,626. The amortization method is an increasing amortization of the unfunded actuarial accrued liability at 4% over 11 years and is expected to fully pay the unfunded actuarial accrued liability by the year 2031. The development of the appropriation as of January 1, 2020 is presented in Section 3, Annual Appropriations.

For fiscal year 2021, we show the actual appropriation developed under the previous funding schedule and reported on the PERAC "Required Fiscal Year 2021 Appropriation" letter dated December 10, 2019 of \$7,565,452. For fiscal year 2022, we developed an annual appropriation of \$8,026,946, which is made up of a normal cost of \$2,821,829 and net 3(8)(c) transfers of \$400,000 and payment toward the unfunded actuarial accrued liability of \$4,805,117. The unfunded actuarial accrued liability is expected to be fully paid by 2031. The Board adopted a schedule that limits the annual increase in appropriation to 6.1% for fiscal years 2022 through 2024 and 6.6% for fiscal years 2025 through 2031. The current funding schedule is shown in Section 3, Exhibit 3.1.

The chart below shows the historical (navy bars) and projected (blue bars) annual appropriations compared to the projected amounts shown in the prior valuation and funding schedule (green line).



SECTION 1 - EXECUTIVE SUMMARY

Plan Provisions

All Plan provisions used in this valuation are the same as those used in the prior valuation and are summarized in Section 5, Summary of Plan Provisions.

Actuarial Assumptions and Methods

Some Actuarial Assumptions and Methods used in this valuation have changed since the last valuation, including increasing administrative expense assumption from \$375,000 to \$400,000, increasing the net 3(8)(c) transfers assumption from \$200,000 to \$400,000, and updating the mortality and mortality improvement rates. Changing these assumptions resulted in a net increase in the unfunded actuarial accrued liability of \$705,971 and a decrease in the employer normal cost of \$24,729. The Actuarial Assumptions and Methods utilized in this valuation are detailed in Section 6, Actuarial Assumptions and Methods.

Census Data

As of January 1, 2020, there are 666 active members who may be eligible for benefits in the future, 338 retirees and beneficiaries, 238 inactives and 31 disabled retirees. Summaries of the active, retired and disabled employees are included in Section 7, Plan Member Information.

SECTION 1 - EXECUTIVE SUMMARY

A summary of principal valuation results from the current valuation and the prior valuation follows.

Valuation Date	January 1, 2020	January 1, 2018	% Change
Census Data			
Active Members	666	666	0.0%
Valuation Salary	\$44,437,598	\$41,262,496	7.7%
Average Salary	\$66,723	\$61,956	7.7%
Retired Members and Beneficiaries	338	293	15.4%
Total Annual Retirement Allowance	\$9,029,207	\$7,130,535	26.6%
Average Annual Retirement Allowance	\$26,714	\$24,336	9.8%
Disabled Members	31	26	19.2%
Total Annual Retirement Allowance	\$1,382,497	\$1,045,966	32.2%
Average Annual Retirement Allowance	\$44,597	\$40,229	10.9%
Inactive Members	238	188	26.6%
Annuity Savings Fund	\$3,293,244	\$2,283,407	44.2%
Funded Status			
Actuarial Accrued Liability (AAL)	\$221,851,136	\$193,470,945	14.7%
Market Value of Assets (MVA)	\$186,551,108	\$155,586,109	19.9%
Unfunded Accrued Liability on MVA	\$35,300,028	\$37,884,836	(6.8%)
Funded Status on MVA	84.1%	80.4%	4.6%
Actuarial Value of Assets (AVA)	\$173,576,041	\$147,758,673	17.5%
Unfunded Accrued Liability on AVA	\$48,275,095	\$45,712,272	5.6%
Funded Status on AVA	78.2%	76.4%	2.4%
Appropriations			
Fiscal Year 2020	N/A	\$7,130,492	N/A
Fiscal Year 2021	\$7,565,453	\$7,565,452	0.0%
Fiscal Year 2022	\$8,026,946	\$8,026,945	0.0%
Fiscal Year 2023	\$8,516,589	\$8,516,589	0.0%

SECTION 2 - PRINCIPAL VALUATION RESULTS

Market Value of Assets

Asset information is reported annually to the Public Employee Retirement Administration Commission by the Dukes County Contributory Retirement Board. The Market Value of Assets for the three most recent calendar years are as follows:

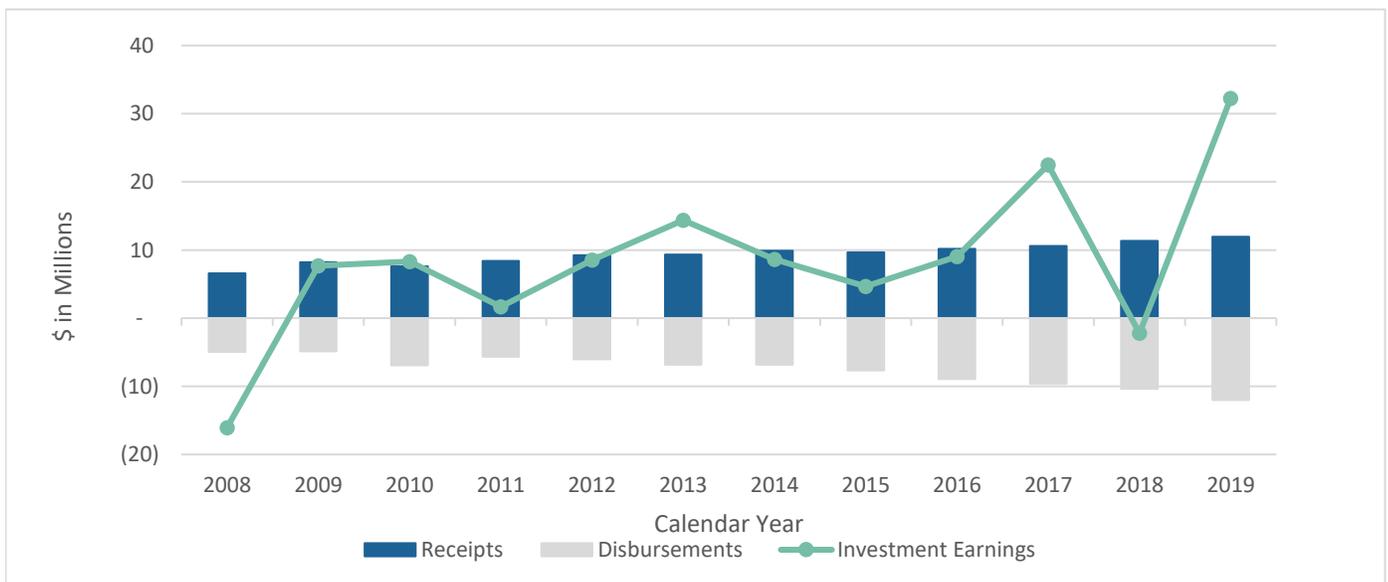
Calendar Year	2019	2018	2017
Trust Fund Composition at Year-End			
Cash	\$6,651,613	\$3,446,451	\$5,160,972
Short-Term Investments	0	0	0
Fixed Income Securities	18,880,649	17,650,513	13,947,194
Equities	71,437,484	38,198,553	38,055,637
Pooled Short Term Funds	0	0	0
Pooled Domestic Equity Funds	0	17,987,343	19,018,574
Pooled International Equity Funds	7,285,696	5,840,960	6,842,946
Pooled Global Equity Funds	0	0	0
Pooled Domestic Fixed Income Funds	0	0	0
Pooled International Fixed Income Funds	0	0	0
Pooled Global Fixed Income Funds	0	0	0
Pooled Alternative Investments	162,130	62,567	0
Pooled Real Estate Funds	14,150,991	12,794,582	12,179,800
Pooled Domestic Balanced Funds	0	0	0
Pooled International Balanced Funds	0	0	0
Hedge Funds	0	0	0
PRIT Cash	0	0	0
PRIT Fund	68,079,852	58,581,272	59,981,693
Interest Due & Accrued	102,140	80,560	58,902
Prepaid Expenses	0	0	0
Accounts Receivable	391,672	336,766	353,526
Land	0	0	0
Buildings	0	0	0
Accumulated Depreciation - Buildings	0	0	0
Accounts Payable	(591,119)	(654,144)	(13,135)
Total Market Value of Assets	\$186,551,108	\$154,325,423	\$155,586,109

SECTION 2 - PRINCIPAL VALUATION RESULTS

Market Value of Assets

Calendar Year	2019	2018	2017
Funds			
Annuity Savings Fund	\$38,072,792	\$37,155,398	\$35,886,136
Annuity Reserve Fund	12,472,374	11,152,626	9,506,295
Special Military Service Fund	30,197	30,167	30,136
Pension Fund	5,770,213	7,230,160	8,479,646
Expense Fund	0	0	0
Pension Reserve Fund	130,205,532	98,757,072	101,683,896
Total Market Value of Assets	\$186,551,108	\$154,325,423	\$155,586,109
Asset Activity			
Market Value as of Beginning of Year	\$154,325,423	\$155,586,109	\$132,147,342
Contributions and Receipts	11,961,375	11,321,164	10,584,908
Benefit Payments and Expenses	(11,990,271)	(10,361,561)	(9,617,774)
Investment Return	32,254,581	(2,220,289)	22,471,633
Total Market Value of Assets	\$186,551,108	\$154,325,423	\$155,586,109
Rate of Return	21.55%	-0.45%	17.50%

Below are the receipts and disbursements during the last 12 years. The green line reflects investment earnings, which vacillate as investment markets fluctuate. Blue bars indicate contributions, from employees and employers, and grey bars show benefit payments and administrative expenses.



SECTION 2 - PRINCIPAL VALUATION RESULTS

Actuarial Value of Assets

The Actuarial Value of Assets is the market value of assets as of the valuation date adjusted to phase in investment gains and losses over a 5-year period, further constrained to be within 20% of the market value of assets. Investment gains and losses are the excess or deficiency of the expected returns over the actual returns.

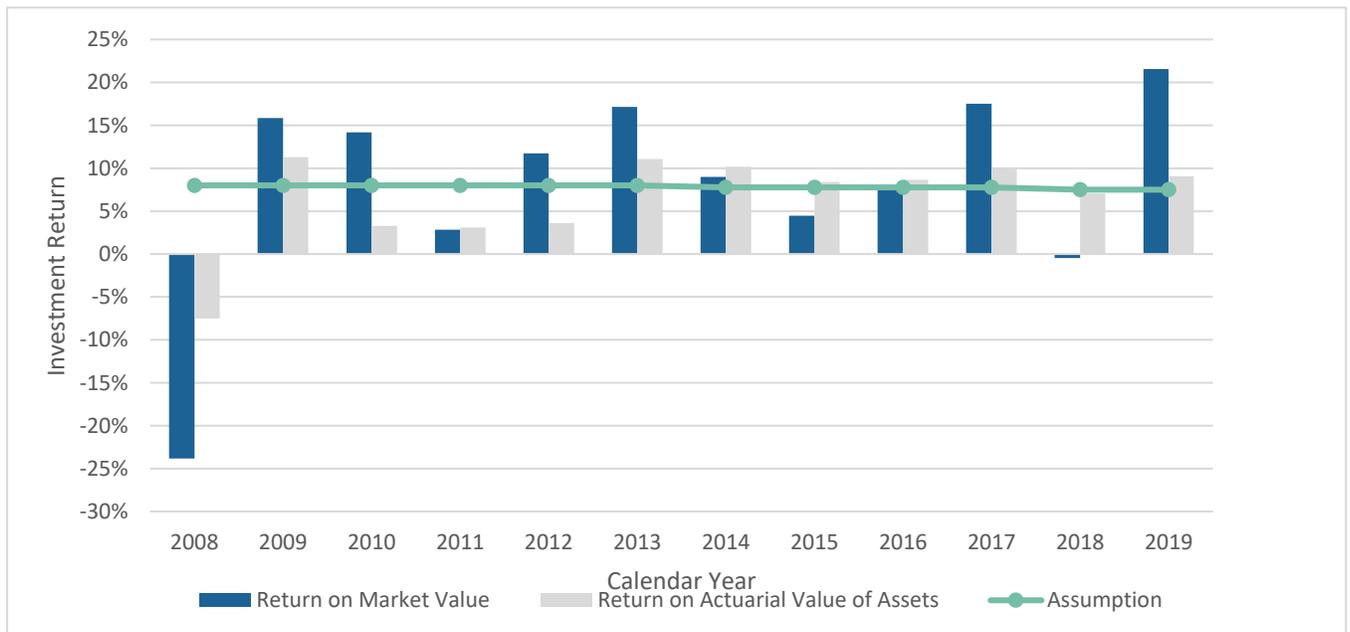
Valuation Date	January 1, 2020	January 1, 2019	January 1, 2018	
1. Expected Market Value of Assets				
a. Market Value of Assets as of prior January 1	\$154,325,423	\$155,586,109	\$132,147,342	
b. Prior Year Contributions and Receipts	11,961,375	11,321,164	10,584,908	
c. Prior Year Benefit Payments and Expenses	(11,990,271)	(10,361,561)	(9,617,774)	
d. Expected Investment Return Rate	7.50%	7.50%	7.75%	
e. Expected Investment Return	11,573,323	11,704,943	10,278,895	
f. Expected Market Value of Assets	\$165,869,850	\$168,250,655	\$143,393,371	
2. Prior Year Gain/(Loss)				
a. Market Value of Assets as of January 1	\$186,551,108	\$154,325,423	\$155,586,109	
b. Expected Market Value of Assets	165,869,850	168,250,655	143,393,371	
c. Prior Year Gain / (Loss)	\$20,681,258	(\$13,925,232)	\$12,192,738	
3. Phase-In of Asset Gains and Losses				
Calendar Year	Gain / (Loss)	Unrecognized Gain / (Loss)	Unrecognized Gain / (Loss)	Unrecognized Gain / (Loss)
a. 2019	\$20,681,258	\$16,545,006	\$0	\$0
b. 2018	(13,925,232)	(8,355,139)	(11,140,186)	0
c. 2017	12,192,738	4,877,095	7,315,643	9,754,190
d. 2016	(459,473)	(91,895)	(183,789)	(275,684)
e. 2015	(4,357,148)	0	(871,430)	(1,742,859)
f. 2014	458,946	0	0	91,789
f. Total Deferred Gains/(Losses)		\$12,975,067	(\$4,879,762)	\$7,827,436

SECTION 2 - PRINCIPAL VALUATION RESULTS

Actuarial Value of Assets

Valuation Date	January 1, 2020	January 1, 2019	January 1, 2018
4. Actuarial Value of Assets			
a. Market Value of Assets	\$186,551,108	\$154,325,423	\$155,586,109
b. Deferred Gains/(Losses)	12,975,067	(4,879,762)	7,827,436
c. Market Value of Assets Less Deferred Gains/(Losses)	\$173,576,041	\$159,205,185	\$147,758,673
d. 80% of Market Value of Assets	149,240,886	123,460,338	124,468,887
e. 120% of Market Value of Assets	223,861,330	185,190,508	186,703,331
f. Actuarial Value of Assets, a., but not less than b. and not greater than c.	\$173,576,041	\$159,205,185	\$147,758,673
g. Ratio of Actuarial Value of Assets to Market Value of Assets	93.0%	103.2%	95.0%
5. Rate of Return on Actuarial Value of Assets for Prior Calendar Year			
	9.05%	7.07%	9.94%

Below are the investment returns during the last 12 years. The green line reflects the investment return actuarial assumption. Blue bars indicate investment return rates on market value of assets, and grey bars show investment return rates on actuarial value of assets.



SECTION 2 - PRINCIPAL VALUATION RESULTS

Actuarial Liabilities

The **Actuarial Present Value of Future Benefits** is the present value of the cost to finance all benefits payable in the future, discounted to reflect the probability of payment and the time value of money. Below is the Actuarial Present Value of Future Benefits from the current valuation and the prior valuation:

Valuation Date	January 1, 2020	January 1, 2018
Actives	\$165,379,619	\$155,723,886
Retired Members and Beneficiaries	93,391,759	72,774,081
Disabled Members	16,110,072	12,487,774
Inactive Members	3,293,244	2,283,407
Total Present Value of Future Benefits	\$278,174,694	\$243,269,148

The **Actuarial Accrued Liability** is the portion of the Actuarial Present Value of Future Benefits which is allocated to all periods prior to a valuation year and therefore is not provided for by future Normal Costs. Below is the Actuarial Accrued Liability from the current valuation and the prior valuation:

Valuation Date	January 1, 2020	January 1, 2018
Actives	\$109,056,061	\$105,925,683
Retired Members and Beneficiaries	93,391,759	72,774,081
Disabled Members	16,110,072	12,487,774
Inactive Members	3,293,244	2,283,407
Total Actuarial Accrued Liability	\$221,851,136	\$193,470,945

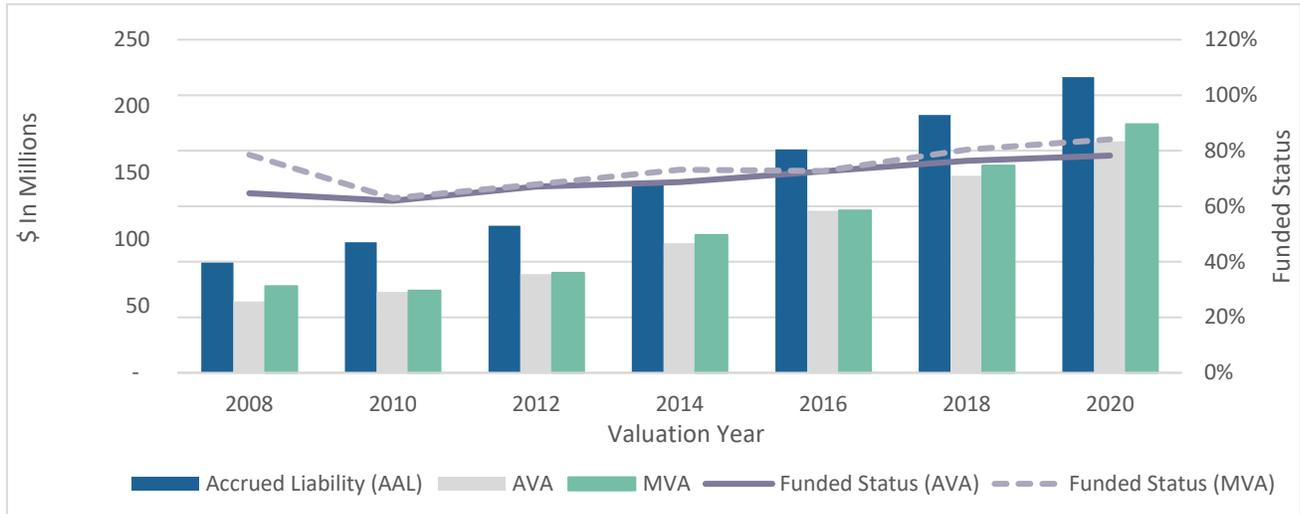
The **Unfunded Actuarial Accrued Liability** is the difference between the Actuarial Accrued Liability and the Actuarial Value of Assets as of the valuation date. The **Funded Status** is the Actuarial Value of Assets divided by the Actuarial Accrued Liability and is a point-in-time measurement of the amount of assets set aside to cover actuarial accrued liabilities. Below is the Unfunded Actuarial Accrued Liability and Funded Status from the current valuation and the prior valuation:

Valuation Date	January 1, 2020	January 1, 2018
Unfunded Actuarial Accrued Liability		
a. Actuarial Accrued Liability	\$221,851,136	\$193,470,945
b. Actuarial Value of Assets	173,576,041	147,758,673
c. Unfunded Actuarial Accrued Liability (a. - b.)	\$48,275,095	\$45,712,272
d. Funded Status (b. divided by a.)	78.2%	76.4%

SECTION 2 - PRINCIPAL VALUATION RESULTS

Actuarial Liabilities

Below are the accrued liabilities, asset values (actuarial and market) and funded status for each of the last 7 valuations. The purple solid line reflects the funded status on an actuarial value of assets (AVA) basis and the purple dotted line reflects the funded status on a market value (MVA) basis. Blue bars indicate actuarial accrued liabilities, grey bars indicate actuarial value of assets and green bars indicate market value of assets.



The **Normal Cost** is the portion of the Actuarial Present Value of Future Benefits which is allocated to a valuation year. Only active employees who have not reached Normal Retirement Age incur a Normal Cost. Below is the Normal Cost from the current valuation and the prior valuation:

Valuation Date	January 1, 2020	January 1, 2018
Total Normal Cost	\$6,524,252	\$5,918,030
As of Percentage of Salary	14.7%	14.3%
Employee Normal Cost	\$4,320,312	\$3,937,927
As of Percentage of Salary	9.7%	9.5%
Administrative Expenses	\$378,944	\$355,260
As a Percentage of Salary	0.9%	0.9%
Net Employer Normal Cost	\$2,582,884	\$2,335,363
As a Percentage of Salary	5.8%	5.7%

SECTION 2 - PRINCIPAL VALUATION RESULTS

Actuarial Experience

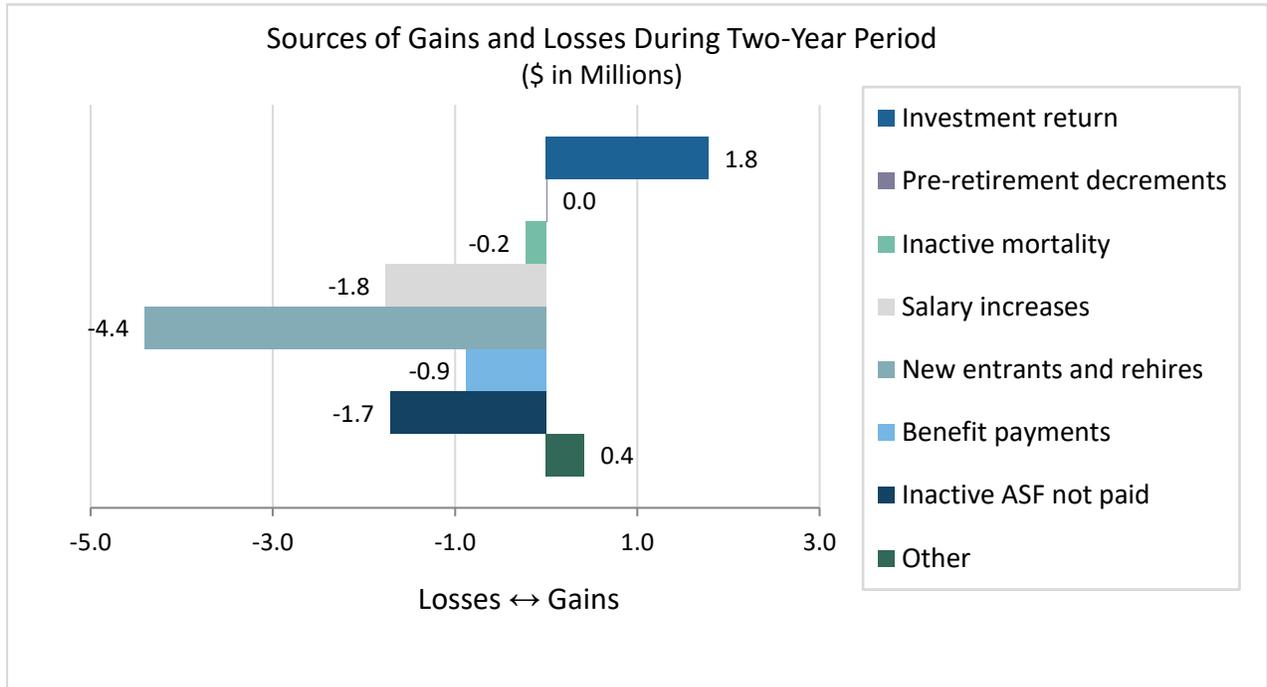
In performing the actuarial valuation, various assumptions are made regarding mortality, retirement, disability and withdrawal rates as well as salary increases and investment returns. A comparison of the results of the current valuation and the prior valuation is made to determine how closely actual experience relates to expected. During the two years since the last valuation, the total unfunded actuarial accrued liability of the System was expected to decrease by \$4,907,909. Below is the development of the Actuarial Loss for the current 2-year period:

Calendar Year Ending	December 31, 2019	December 31, 2018
Expected Unfunded Actuarial Accrued Liability		
1. Unfunded Actuarial Accrued Liability, Beginning of Year	\$43,756,867	\$45,712,272
2. Normal Cost, Beginning of Year	5,744,798	5,918,030
3. Total Contributions	11,961,375	11,321,164
4. Interest (full year on 1. and 2., one-half year on 3.)	3,264,073	3,447,729
5. Expected Unfunded Actuarial Accrued Liability	\$40,804,363	\$43,756,867
6. Unfunded Actuarial Accrued Liability (before changes)	47,569,124	
7. (Gain)/Loss (6. - 5.)	\$6,764,761	
Asset Gain/(Loss)		
1. Actuarial Value of Assets, Beginning of Year	\$159,205,185	\$147,758,673
2. Contributions and Receipts	11,961,375	11,321,164
3. Benefit Payments and Expenses	(11,990,271)	(10,361,561)
4. Assumed Rate of Return (prior valuation)	7.50%	7.50%
5. Expected Return	11,939,305	11,117,886
6. Actuarial Value of Assets, End of Year	\$173,576,041	\$159,205,185
7. Actual Return	14,399,752	10,486,909
8. Actual Rate of Return	9.05%	7.07%
9. Asset Gain/(Loss) (7. - 5.)	2,460,447	(630,977)
10. Total Asset Gain/(Loss), 2-Year Period	\$1,782,147	

SECTION 2 - PRINCIPAL VALUATION RESULTS

Actuarial Experience

Below are the various sources of gains and losses over the 2-year period. The asset gain during the period was \$1,782,147, and the total demographic loss during the period was \$8,546,908, which totals to an overall loss of \$6,764,761.



Unfunded Actuarial Accrued Liability

1. Changes due to:	
a. Asset Gain	(\$1,782,147)
b. Demographic Experience Loss	8,546,908
c. Total Loss Prior to Changes	6,764,761
d. Plan Change	-
e. Assumption Change - Change in Mortality and Mortality Improvement Rates	705,971
f. Total Increase (including changes)	7,470,732
2. Unfunded Actuarial Accrued Liability, End of Year	\$48,275,095

SECTION 3 - CHAPTER 32 OF M.G.L. APPROPRIATIONS

Annual Appropriations

The Annual Appropriation is determined in accordance with the requirements set forth in Sections 22D and 22F of Chapter 32 of the Massachusetts General Laws ("M.G.L."). The appropriation is comprised of the annual employer normal cost and amortization payments to pay the unfunded actuarial accrued liability. Below are the details of the annual appropriations for the current and prior valuations, adjusted for semi-annual payments made July 1 and January 1. The appropriations shown are based on the results of the valuation and do not account for any adjustments made to appropriations in the selected funding schedule.

Valuation Date	January 1, 2020	January 1, 2018
1. Early Retirement Incentive Plan (2002)		
Fully Funded Year	2028	2028
Investment Return Rate	7.50%	7.50%
Balance as of Valuation Date	\$1,229,947	\$1,370,228
Amortization Amount	\$169,397	\$155,122
Increasing Rate	4.50%	4.50%
Remaining Payment Period from Valuation Date	8	10
2. Early Retirement Incentive Plan (2003)		
Fully Funded Year	2028	2028
Investment Return Rate	7.50%	7.50%
Balance as of Valuation Date	\$424,615	\$473,044
Amortization Amount	\$58,481	\$53,553
Increasing Rate	4.50%	4.50%
Remaining Payment Period from Valuation Date	8	10
3. Unfunded Actuarial Accrued Liability		
Fully Funded Year	2031	2030
Balance as of Valuation Date	\$46,620,533	\$43,869,000
Amortization Amount	\$4,973,748	\$4,251,209
Increasing Rate	4.00%	4.50%
Remaining Payment Period from Valuation Date	11	12
4. Total Amortization Payments	\$5,201,626	\$4,459,884
5. Normal Cost	\$2,582,884	\$2,335,363
6. Net 3(8)(c) Transfers	\$378,944	\$189,472
7. Total Appropriation as of January 1	\$8,163,454	\$6,984,719
8. Adjusted for Semi-Annual Payments as of July 1 and January 1	\$8,617,064	\$7,372,831

SECTION 3 - CHAPTER 32 OF M.G.L. APPROPRIATIONS

Exhibit 3.1 - 30-Year Forecast of Annual Appropriations

Fiscal Year Ending	Employer Normal Cost	Amortization Payment of UAL	Amortization Payment of ERI 2002	Amortization Payment of ERI 2003	Net 3(8)(c) Transfers	Total Employer Cost	Increase over Prior Year	Unfunded Actuarial Accrued Liability
2021	\$2,701,404	\$4,423,508	\$178,810	\$61,731	\$200,000	\$7,565,453		\$48,275,095
2022	2,821,829	4,553,752	186,856	64,509	400,000	8,026,946	6.10%	47,145,809
2023	2,920,593	4,933,319	195,265	67,412	400,000	8,516,589	6.10%	45,788,160
2024	3,022,814	5,338,791	204,051	70,445	400,000	9,036,101	6.10%	43,930,613
2025	3,128,612	5,817,023	213,234	73,615	400,000	9,632,484	6.60%	41,508,775
2026	3,238,113	6,330,358	222,830	76,928	400,000	10,268,229	6.60%	38,405,682
2027	3,351,447	6,881,239	232,857	80,389	400,000	10,945,932	6.60%	34,533,926
2028	3,468,748	7,472,272	243,335	84,006	400,000	11,668,361	6.60%	29,797,028
2029	3,590,154	8,448,320	-	-	400,000	12,438,474	6.60%	24,088,592
2030	3,715,810	9,143,604	-	-	400,000	13,259,414	6.60%	17,291,374
2031	3,845,863	9,791,725	-	-	400,000	14,037,588	5.87%	9,276,280
2032	3,980,467	-	-	-	400,000	4,380,467	-68.79%	-
2033	4,119,784	-	-	-	400,000	4,519,784	3.18%	-
2034	4,263,977	-	-	-	400,000	4,663,977	3.19%	-
2035	4,413,216	-	-	-	400,000	4,813,216	3.20%	-
2036	4,567,679	-	-	-	400,000	4,967,679	3.21%	-
2037	4,727,547	-	-	-	400,000	5,127,547	3.22%	-
2038	4,893,012	-	-	-	400,000	5,293,012	3.23%	-
2039	5,064,267	-	-	-	400,000	5,464,267	3.24%	-
2040	5,241,515	-	-	-	400,000	5,641,515	3.24%	-
2041	5,424,968	-	-	-	400,000	5,824,968	3.25%	-
2042	5,614,842	-	-	-	400,000	6,014,842	3.26%	-
2043	5,811,361	-	-	-	400,000	6,211,361	3.27%	-
2044	6,014,758	-	-	-	400,000	6,414,758	3.27%	-
2045	6,225,274	-	-	-	400,000	6,625,274	3.28%	-
2046	6,443,159	-	-	-	400,000	6,843,159	3.29%	-
2047	6,668,670	-	-	-	400,000	7,068,670	3.30%	-
2048	6,902,073	-	-	-	400,000	7,302,073	3.30%	-
2049	7,143,646	-	-	-	400,000	7,543,646	3.31%	-
2050	7,393,674	-	-	-	400,000	7,793,674	3.31%	-

SECTION 3 - CHAPTER 32 OF M.G.L. APPROPRIATIONS

Exhibit 3.2 - 30-Year Forecast of Cash Flow

Calendar Year	Market Value of Assets, BOY	Benefit Payments	Employee Contributions	Employer Contributions	Investment Return	Market Value of Assets, EOY
2020	\$186,551,108	\$15,069,186	\$4,320,312	\$7,167,200	\$14,287,802	\$197,257,236
2021	197,257,236	12,807,053	4,471,523	7,414,928	15,205,512	211,542,146
2022	211,542,146	13,719,114	4,628,026	8,068,268	16,303,416	226,822,742
2023	226,822,742	14,656,394	4,790,007	8,560,433	17,463,374	242,980,161
2024	242,980,161	15,656,947	4,957,657	9,125,422	18,692,607	260,098,900
2025	260,098,900	16,520,326	5,131,175	9,727,700	20,002,321	278,439,770
2026	278,439,770	17,444,466	5,310,766	10,369,728	21,404,852	298,080,649
2027	298,080,649	18,290,890	5,496,643	11,054,129	22,911,448	319,251,979
2028	319,251,979	19,176,599	5,689,026	11,783,702	24,535,231	342,083,339
2029	342,083,339	20,086,322	5,888,142	12,561,426	26,286,731	366,733,315
2030	366,733,315	20,982,127	6,094,227	13,298,637	28,172,634	393,316,686
2031	393,316,686	21,957,293	6,307,525	4,149,876	29,459,658	411,276,452
2032	411,276,452	22,945,371	6,528,288	4,281,859	30,796,043	429,937,270
2033	429,937,270	23,977,913	6,756,778	4,418,461	32,184,266	449,318,862
2034	449,318,862	25,056,919	6,993,265	4,559,844	33,625,763	469,440,815
2035	469,440,815	26,184,480	7,238,029	4,706,176	35,121,958	490,322,497
2036	490,322,497	27,362,782	7,491,360	4,857,629	36,674,257	511,982,961
2037	511,982,961	28,594,107	7,753,558	5,014,383	38,284,039	534,440,833
2038	534,440,833	29,880,842	8,024,933	5,176,623	39,952,648	557,714,195
2039	557,714,195	31,225,480	8,305,806	5,344,541	41,681,385	581,820,447
2040	581,820,447	32,630,627	8,596,509	5,518,337	43,471,498	606,776,163
2041	606,776,163	34,099,005	8,897,387	5,698,216	45,324,170	632,596,931
2042	632,596,931	35,633,460	9,208,796	5,884,390	47,240,504	659,297,161
2043	659,297,161	37,236,966	9,531,104	6,077,080	49,221,515	686,889,893
2044	686,889,893	38,912,629	9,864,693	6,276,514	51,268,109	715,386,580
2045	715,386,580	40,663,697	10,209,957	6,482,929	53,381,071	744,796,840
2046	744,796,840	42,493,563	10,567,305	6,696,569	55,561,045	775,128,195
2047	775,128,195	44,405,773	10,937,161	6,917,686	57,808,512	806,385,781
2048	806,385,781	46,404,033	11,319,962	7,146,542	60,123,770	838,572,021
2049	838,572,021	48,492,214	11,716,161	7,383,408	62,506,911	871,686,287

SECTION 3 - CHAPTER 32 OF M.G.L. APPROPRIATIONS

Forecast Notes

Exhibit 3.1:

- ◆ The Employer Normal Cost is expected to increase 3.5% per year.
- ◆ The Unfunded Actuarial Accrued Liability ("UAL") is computed as of January 1 of each year assuming no future gains or losses.
- ◆ The Amortization Payment of UAL is an increasing payment at 4% paid over 11 years through 2031.
- ◆ The Amortization Payment of the Early Retirement Incentive Plan (2002) is an increasing payment at 4.5% paid over 8 year(s) through 2028.
- ◆ The Amortization Payment of the Early Retirement Incentive Plan (2003) is an increasing payment at 4.5% paid over 8 year(s) through 2028.
- ◆ Net 3(8)(c) transfers are a level dollar amount based on the net transfers expected to be paid by the Dukes County Contributory Retirement Board during the current year offset by the amount received during the same period.
- ◆ Total Employer Cost is the sum of the Employer Normal Cost, net 3(8)(c) transfers and the Amortization of the UAL, all computed as of January 1 of each year and adjusted for semi-annual payments made on July 1 and January 1.
- ◆ For fiscal year 2021, we show the actual appropriation developed under the previous funding schedule of \$7,565,453. For fiscal years 2022 and later, the Board has selected a funding schedule that fully amortizes the unfunded actuarial accrued liability by 2031, with annual employer costs limited to increases of 6.1% over the prior year for fiscal years 2022 through 2024, and 6.6% for fiscal years 2025 through 2031.

Exhibit 3.2:

- ◆ Expected benefit payments include payments expected to be made to retired members, beneficiaries, disabled members and active members expected to retire. In addition, expected benefit payments include distribution of the annuity savings fund attributed to inactive members.
- ◆ Benefit payments exclude cost-of-living increases granted to members in pay status between 1982 and 1997. In addition, benefit payments are as expected for the first ten years of the forecast, then increase by the greater of 4.5% per year thereafter or the expected future payments for the current population projected by our computer model.
- ◆ Calendar year cash flow entries are developed as of each January 1.

SECTION 4 - DISCLOSURES

4.1 - GASB 67 and GASB 68 Disclosures

In June 2012, the GASB approved two related Statements that significantly changed the way pension plans and governments account and report pension liabilities. Effective for plans with fiscal years beginning after June 15, 2013, GASB Statement No. 67, *Financial Reporting for Pension Plans*, replaced the requirements of Statement No. 25 and effective for employers with fiscal years beginning after June 15, 2014, GASB Statement No. 68, *Accounting and Financial Reporting for Pensions*, replaced the requirements of Statement No. 27.

The pension standards reflect changes from those previously in place regarding how governments calculate total pension liability and pension expense. Further, the standards contain requirements for disclosing information in the notes to financial statements and presenting required supplementary information following the notes.

GASB 67 requires defined benefit pension plans, such as the Dukes County Contributory Retirement System, to present a statement of fiduciary net position (pension plan assets) and a statement of changes in fiduciary net position. Further, the statement requires that notes to financial statements include descriptive information such as the types of benefits provided, the classes of plan members covered and the composition of the pension plan's retirement board. Finally, GASB 67 requires pension plans to present in required supplementary information the sources of the changes in the net pension liability and information about the actuarially determined contributions compared with the actual contributions made to the plan and related ratios.

GASB 67 and GASB 68 require projected benefit payments be discounted to their actuarial present value using the single rate that reflects:

- (1) a long-term expected rate of return on pension plan investments *to the extent that the pension plan's assets are sufficient to pay benefits and pension plan assets are expected to be invested using a strategy to achieve that return* and
- (2) a tax-exempt, high-quality municipal bond rate *to the extent that the conditions for use of the long-term expected rate of return are not met.*

GASB 68 establishes standards for measuring and recognizing liabilities, deferred outflows of resources, deferred inflows of resources and pension expense by state and local governments.

The effective date for GASB 67 is for plan years beginning after June 15, 2013, which is the fiscal year ending December 31, 2014 for the Dukes County Contributory Retirement System. The effective date for GASB 68 is for employers' fiscal years beginning after June 15, 2014. The GASB report, submitted under separate cover and prepared as of December 31, 2019 (the measurement date), presents information to assist the Dukes County Contributory Retirement Board in providing the required information under GASB 68 to participating employers.

SECTION 4 - DISCLOSURES

4.2 - PERAC Disclosure Information

The most recent actuarial valuation of the System was prepared by KMS Actuaries, LLC as of January 1, 2020.

Normal Cost - Employees	\$4,320,312	9.7% of payroll
Normal Cost - Employers	\$2,582,884	5.8% of payroll
Actuarial Liability - Active Members	\$109,056,061	49% of total AAL
Actuarial Liability - Retired and Inactive Members	112,795,075	51% of total AAL
Total Actuarial Liability (AAL)	<u>\$221,851,136</u>	
System Assets	\$173,576,041	
Unfunded Actuarial Accrued Liability	\$48,275,095	
Funded Status		78.2%

Principal actuarial assumptions used in the valuation:

Investment Return		7.50%
Rate of Salary Increase	Based on service, 6% graded down to 4.25% for Group 1 Based on service, 7% graded down to 4.75% for Group 4	

SECTION 4 - DISCLOSURES

4.3 - Risk Measures

The Dukes County Contributory Retirement System is subject to certain risks that could affect the plan's future financial condition. Here we identify the primary risks to the System, provide some background information about those risks, and provide an assessment of those risks in accordance with Actuarial Standards of Practice (ASOP) 51.

Risk is the potential of actual future measurements deviating from expected future measurements resulting from actual future experience deviating from actuarially assumed experience. Examples of potential risks that may be reasonably anticipated to significantly affect the future financial condition of the plan include the following:

- ◆ **Investment Risk** - the potential that investment returns will be different than expected.
- ◆ **Asset/Liability Mismatch Risk** - the potential that changes in asset values are not matched by changes in the value of liabilities.
- ◆ **Interest Rate Risk** - the potential that interest rates will be different than expected.
- ◆ **Longevity and Other Demographic Risks** - the potential that mortality or other demographic experience will be different than expected.
- ◆ **Contribution Risk** - the potential of actual future contributions deviating from expected future contributions. For example, that actual contributions are not made in accordance with the plan's funding policy, that other anticipated payments to the plan are not made, or that material changes occur in the anticipated number of covered employees, covered payroll, or other relevant contribution base.

We have provided several risk measures in this section that we believe are most significant for the plan. However, we believe that a more rigorous assessment of risk would be beneficial to the Board to understand the risks identified above, such as:

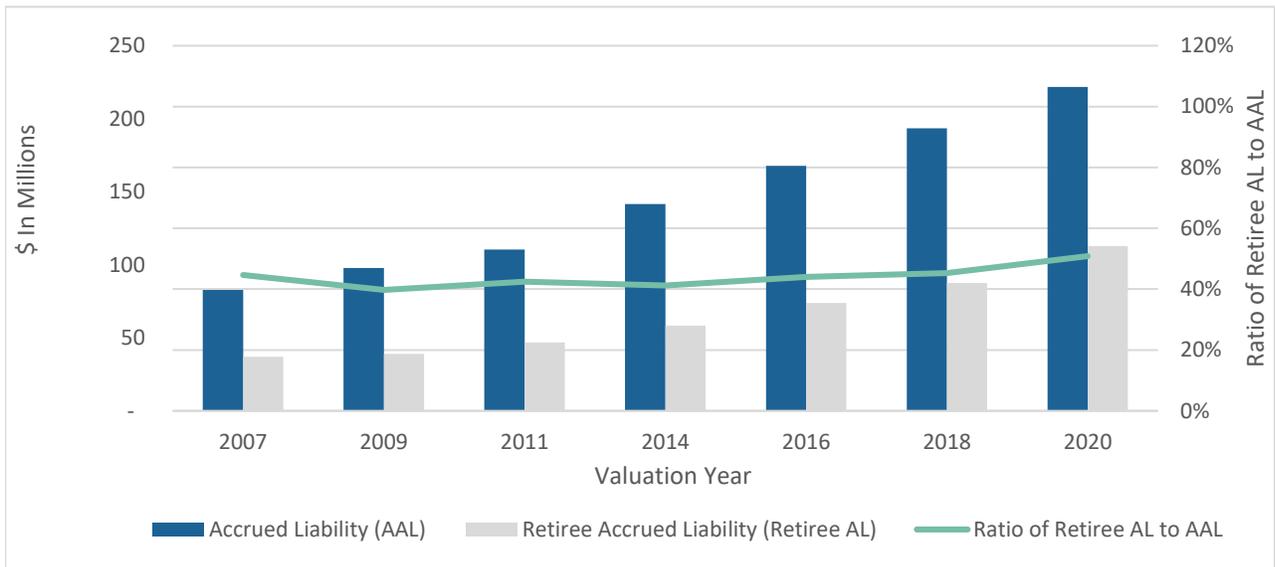
- ◆ **Scenario Test** - a process for assessing the impact of one possible event, or several simultaneous or sequentially occurring possible events, on a plan's financial condition.
- ◆ **Sensitivity Test** - a process for assessing the impact of a change in an actuarial assumption on an actuarial measurement.
- ◆ **Stochastic Modeling** - a process for generating numerous potential outcomes by allowing for random variations in one or more inputs over time for the purpose of assessing the distribution of those outcomes.
- ◆ **Stress Test** - a process for assessing the impact of adverse changes in one or relatively few factors affecting a plan's financial condition.

SECTION 4 - DISCLOSURES

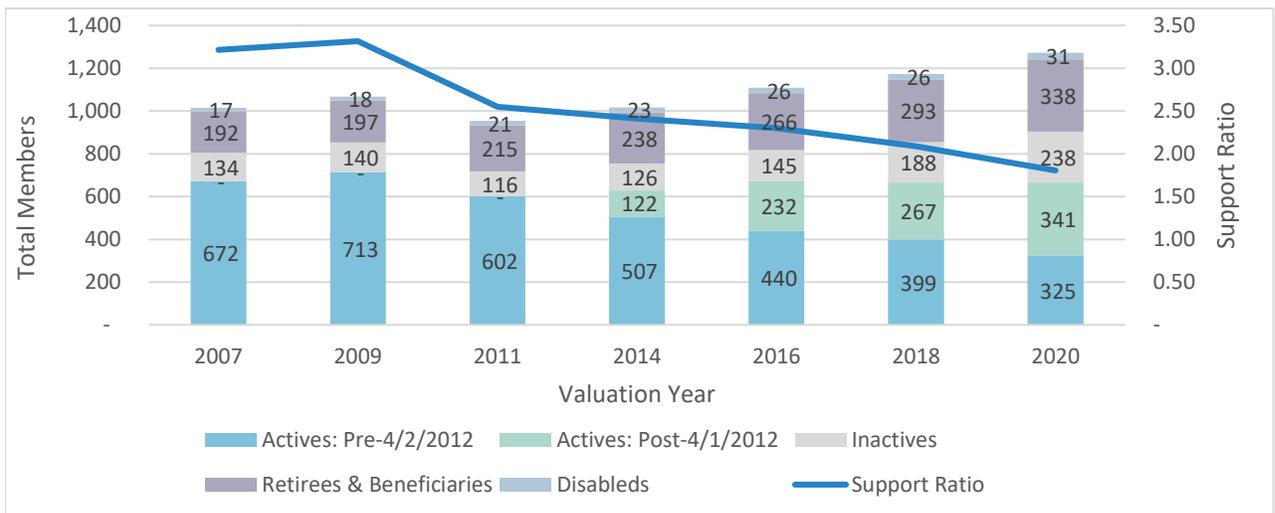
4.3 - Risk Measures

Maturity Measures

As retirement systems mature they become much more sensitive to risks. This is because a higher proportion of the actuarial liability is attributable to participants who are no longer active. Plan maturity measures are helpful in understanding the risks associated with a plan. One such maturity measure is the ratio of the system's retiree liability to its total liability. A retirement system in its infancy will have a very low ratio of retiree liability to total liability. As the system matures, the ratio starts increasing. A mature plan will often have a ratio above 60%. For the Dukes County Contributory Retirement System and other retirement systems in the United States these ratios have been steadily increasing in recent years.



Another maturity measure is the ratio of actives to retirees, or support ratio. A retirement system in its infancy will have a very high ratio of active to retired members. As the system matures, and members retire, the support ratio starts declining. A mature system will often have a support ratio near or below one.



SECTION 4 - DISCLOSURES

4.3 - Risk Measures

Volatility Indices

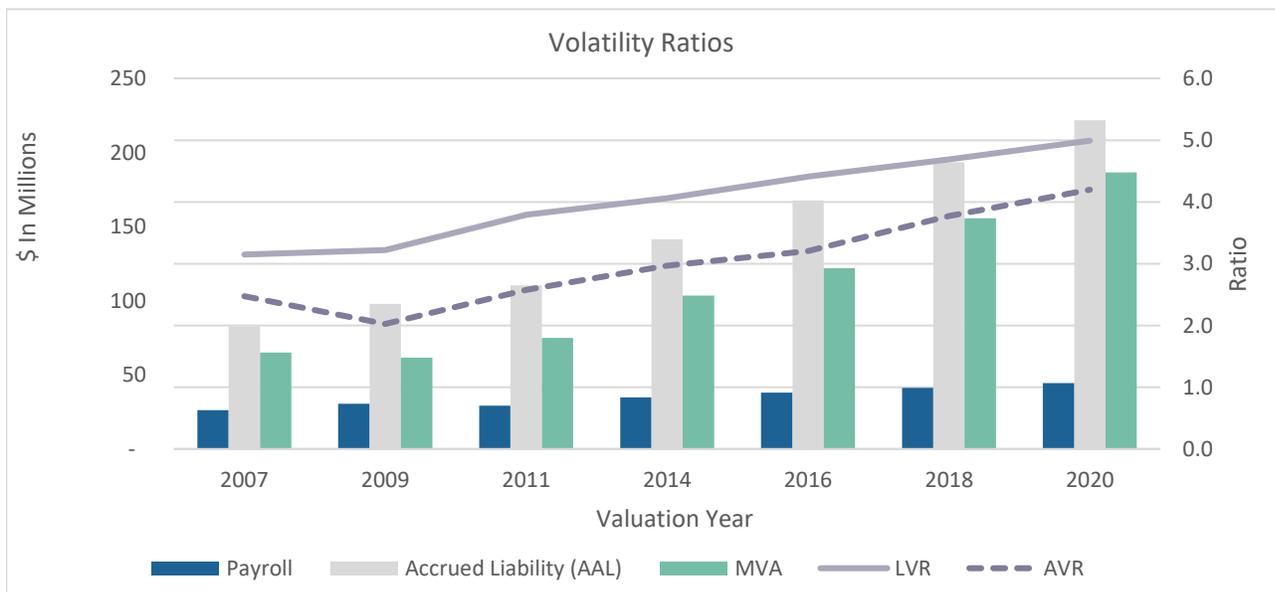
Volatility indices are measures of the relative sensitivity of employer contributions to changes in assets or liabilities. Below we present two such indices - the Asset Volatility Ratio (AVR) and the Liability Volatility Ratio (LVR):

Asset Volatility Ratio (AVR)

The Asset Volatility Ratio (AVR) is the ratio of the Market Value of Assets (MVA) to Payroll. Systems with a higher AVR experience more volatile employer contributions (as a percentage of payroll) due to investment return. This ratio indicates a measure of the system's current contribution volatility. The AVR increases over time but generally tends to stabilize as the system matures.

Liability Volatility Ratio (LVR)

The Liability Volatility Ratio (LVR) is the ratio of the Actuarial Accrued Liability (AAL) to Payroll. Systems with a higher LVR experience more volatile employer contributions (as a percentage of payroll) due to the investment return assumption and changes in liability. This ratio indicates a longer-term potential for contribution volatility. The AVR, described above, will tend to move close to the LVR as the system matures.

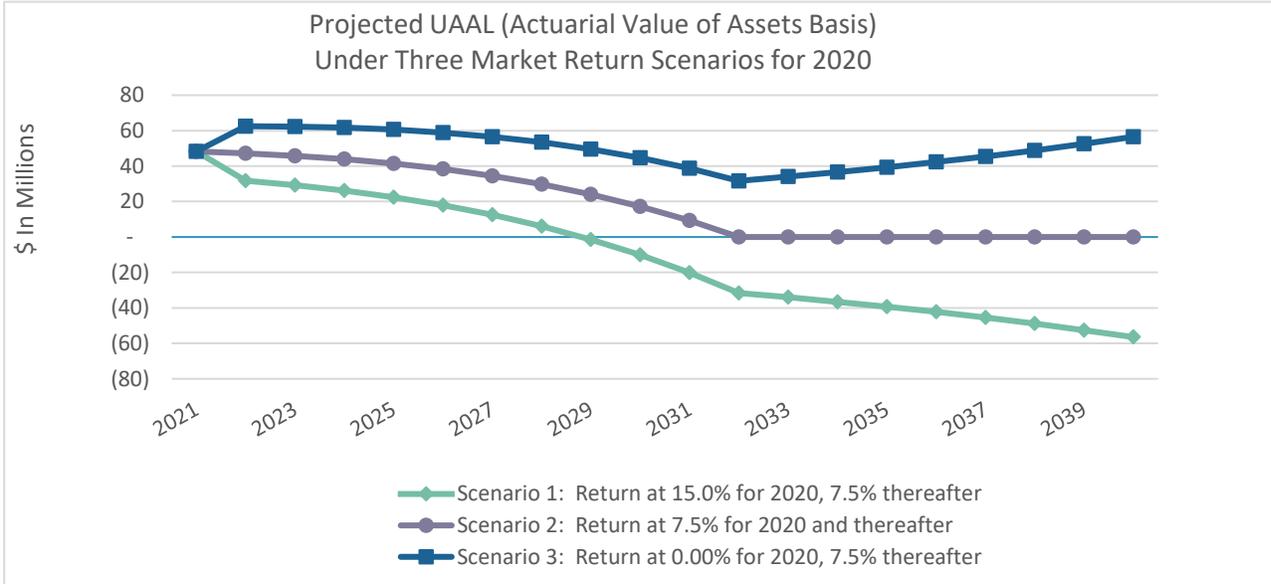


SECTION 4 - DISCLOSURES

4.3 - Risk Measures

Market Return Scenarios

Below we illustrate the projected effect on funding levels of a single year of investment return above or below the assumed investment return. Scenario 1 assumes a one-year return of 2 times the assumed return and the expected return thereafter, Scenario 2 assumes assets earn the expected return every year and Scenario 3 assumes a one-year return of 0% and the expected return thereafter.



Sensitivity Analysis

The following presents the Actuarial Accrued Liability and Funded Status calculated using the investment return rate of 7.5%, as well as what the Actuarial Accrued Liability and Funded Status would be if it were calculated using an investment return rate 1-percentage point lower (6.5%) or 1-percentage point higher (8.5%) than the assumed investment return rate:

	1% Decrease (6.5%)	Current Investment Return Rate (7.5%)	1% Increase (8.5%)
Actuarial Accrued Liability	\$247,709,664	\$221,851,136	\$199,983,715
% Change	12%		-10%
Actuarial Value of Assets	\$173,576,041	\$173,576,041	\$173,576,041
Unfunded Actuarial Accrued Liability	74,133,623	48,275,095	26,407,674
% Change	54%	N/A	-45%
Funded Status	70.1%	78.2%	86.8%

SECTION 4 - DISCLOSURES

4.3 - Risk Measures

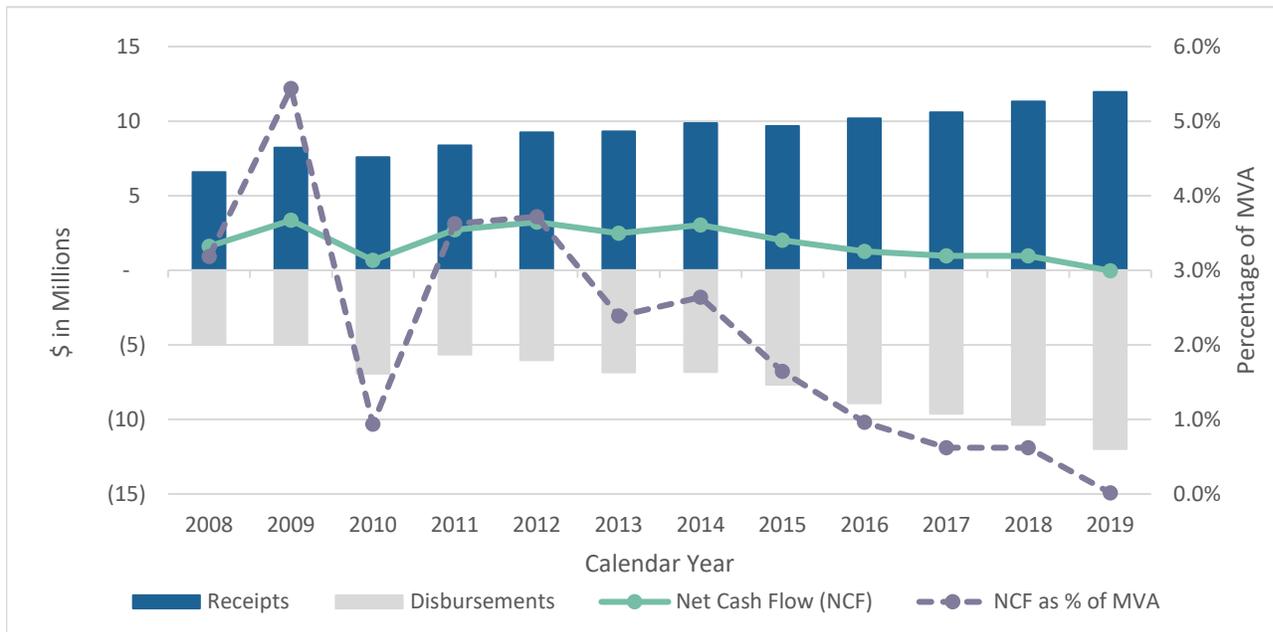
Duration

Duration is another measure that is used to describe how the present value of a cash flow series changes when small changes are made to the underlying interest rates. The duration of the Dukes County Contributory Retirement System is 11, and this represents an approximate percentage change in the Actuarial Accrued Liability for each 1% change to the investment return rate.

Net Cash Flow (NCF)

Net cash flow (NCF) during a year is the difference between contributions, both employer and employee, paid into the System and benefit payments and expenses paid from the System. If the level of benefit payments plus expenses is greater than contributions, then the System has negative NCF. Mature plans generally have a negative NCF as the number of retirees grows. When a System has negative NCF, then additional cash from existing assets are needed to pay the pension benefits.

Historical NCF since 2008 is shown in the next graph. Blue bars indicate contributions, from employees and employers, and grey bars show benefit payments and administrative expenses. The NCF is represented by the green line. The dashed purple line (which corresponds to the right-hand axis) provides the NCF as a percentage of the Market Value of Assets. As of December 31, 2019, the NCF was negative \$0.029 million, which represents 0.015% of the Market Value of Assets. The NCF falls within the range of 0.015% to 5.4% of total assets over the 12-year period.



SECTION 5 - SUMMARY OF PLAN PROVISIONS

Administration

There are 104 contributory retirement systems for public employees in Massachusetts. Each system is governed by a retirement board and all boards, although operating independently, are governed by Chapter 32 of the Massachusetts General Laws, Chapter 34B, Section 19 and other applicable statutes. This law in general provides uniform benefits, uniform contribution requirements and a uniform accounting and funds structure for all systems.

Participation

Participation is mandatory for all full-time employees. Eligibility with respect to part-time, provisional, temporary, seasonal or intermittent employment is governed by regulations promulgated by the local retirement board, and approved by PERAC. Membership is optional for certain elected officials.

Membership Groups

There are four membership groups in the Retirement System:

Group 1	General employees, including clerical, administrative, technical and all other employees not otherwise classified.
Group 2	Certain specified hazardous duty positions.
Group 3	State police officers and inspectors.
Group 4	Local police officers, firefighters and other specified hazardous positions.

For members in more than one group, participation will be proportional.

Member Contributions

Member contributions vary depending on the most recent date of membership:

Prior to 1975	5% of Salary
1975 - 1983	7% of Salary
1984 - June 30, 1996	8% of Salary
July 1, 1996 - present	9% of Salary
1979 - present	An additional 2% of Salary in excess of \$30,000.
Group 1 members hired on or after April 2, 2012	6% of Salary with 30 or more years of creditable service.

Rate of Interest

Interest on regular deductions made after January 1, 1984 is a rate established by PERAC in consultation with the Commissioner of Banks. The rate is obtained from the average rates paid on individual savings accounts by a representative sample of at least ten financial institutions.

SECTION 5 - SUMMARY OF PLAN PROVISIONS

Retirement Age The mandatory retirement age for some Group 2 and Group 4 members is age 65. Most Group 2 and Group 4 members may remain in service after reaching age 65. Group 4 members who are employed in certain public safety positions are required to retire at age 65. There is no mandatory retirement age for members in Group 1.

Salary Gross regular compensation. This does not include bonuses, overtime, severance pay, unused sick leave credit or other similar compensation.

Average Salary

Membership before April 2, 2012 ♦ Average annual rate of regular compensation received during the three consecutive years that produce the highest average, or, if greater, during the last three years (whether or not consecutive) preceding retirement.

Membership on or after April 2, 2012 ♦ Average annual rate of regular compensation received during the five consecutive years that produce the highest average, or, if greater, during the last five years (whether or not consecutive) preceding retirement.

Creditable Service The period during which a member contributes to the retirement system plus certain periods of military service and “purchased” service.

Benefit Rate The benefit rate varies with the member's retirement age, Group, membership date and years of creditable service at retirement. Each year a member retires prior to the age at which the 2.5% maximum benefit rate applies, a reduction is applied to each year of age under the maximum age. The maximum age and reduction for each Group and membership date is as follows:

	Group 1	Group 2	Group 4
2.5% for Membership before April 2, 2012:			
Maximum age:	65	60	55
Reduction:	0.1%	0.1%	0.1%
2.5% for Membership on or after April 2, 2012 (less than 30 years of service):			
Maximum age:	67	62	57
Reduction:	0.15%	0.15%	0.15%
2.5% for Membership on or after April 2, 2012 (30+ years of service):			
Maximum age:	67	62	57
Reduction:	0.125%	0.125%	0.125%

SECTION 5 - SUMMARY OF PLAN PROVISIONS

Superannuation Retirement

Eligibility if membership before April 2, 2012	<ul style="list-style-type: none">♦ completion of 20 years of Creditable Service, or♦ attainment of age 55 if hired prior to 1978, or♦ attainment of age 55 with 10 years of Creditable Service, if hired after 1978.
Eligibility if membership on or after April 2, 2012	<ul style="list-style-type: none">♦ attainment of age 60 with 10 years of Creditable Service if classified in Group 1♦ attainment of age 55 with 10 years of Creditable Service if classified in Group 2♦ attainment of age 55 if classified in Group 4
Benefit Amount	Product of the member's Benefit Rate, Average Salary and Creditable Service.
Maximum Benefit	80% of the member's Average Salary.
Veteran's Benefit	Additional benefit of \$15 per year of Creditable Service, up to a maximum of \$300.

Deferred Vested

Eligibility	<ul style="list-style-type: none">♦ completion of ten or more years of Creditable Service.♦ elected officials hired prior to 1978, completion of six years of Creditable Service.
Benefit Amount	Accrued benefit payable commencing at age 55, or the completion of 20 years of Creditable Service, or may be deferred until later at the participant's option.

Withdrawal of Contributions

- Contributions may be withdrawn upon termination of employment.
- ♦ Members hired on or after January 1, 1984 who terminate with less than ten years of Creditable Service receive contributions plus interest on the Annuity Savings Account at an annual rate of 3%.
 - ♦ All other withdrawals receive contributions plus 100% of the regular interest that has accrued to the Annuity Savings Account.

SECTION 5 - SUMMARY OF PLAN PROVISIONS

Ordinary Disability Retirement	Eligibility	Non-job related disability after completion of ten years of Creditable Service.
	Benefit Amount for Group 1 membership before April 2, 2012 or Group 2 or Group 4	Superannuation benefit determined if the member is age 55, up to a maximum of 80% of Average Salary over three years. If the member is a veteran, 50% of final rate of salary (final year) plus an annuity based on the accumulated member contributions plus credited interest, up to a maximum of 80% of Average Salary over five years.
	Benefit Amount for Group 1 membership on or after April 2, 2012	Superannuation benefit determined if the member is age 60, up to a maximum of 80% of Average Salary over three years. If the member is a veteran, 50% of final rate of salary (final year) plus an annuity based on the accumulated member contributions plus credited interest, up to a maximum of 80% of Average Salary over five years.
Accidental Disability Retirement	Eligibility	Disabled as a result of an accident in the performance of duties. There is no minimum age or service requirement.
	Benefit Amount	72% of Salary plus an annuity based on accumulated member contributions plus credited interest.
	Maximum Benefit	100% of Salary if hired before January 1, 1988, otherwise 75% of Salary.
	Veteran's Benefit	Additional allowance of \$15 per year of Creditable Service, up to a maximum of \$300.
	Supplemental Dependent Allowance	Additional allowance of \$952.32 per year for each child until age 18 (or age 22 if a full-time student).
Non-Occupational Death	Eligibility	For members with at least two years of creditable service who die while in active service, but not due to occupational injury.
	Benefit Amount	Benefit as if Option C had been elected. Minimum benefit of \$250 per month for surviving spouse, \$120 per month for first child and \$90 per month for each additional child.

SECTION 5 - SUMMARY OF PLAN PROVISIONS

Accidental Death	Eligibility	For members who die as a result of an occupational injury.
	Benefit Amount	72% of Salary plus an annuity based on accumulated member contributions plus credited interest.
	Maximum Benefit	100% of Salary if hired before January 1, 1988, otherwise 75% of Salary.
	Veteran's Benefit	Additional allowance of \$15 per year of creditable service, up to a maximum of \$300.
	Supplemental Dependent Allowance	Additional allowance of \$952.32 per year for each child until age 18 (or age 22 if a full-time student).
Cost-of-Living Adjustment (COLA)	In accordance with the adoption of Chapter 17 of the Acts of 1997, the granting of a Cost-of-Living Adjustment will be determined by an annual vote by the Retirement Board. The amount of increase will be based upon the Consumer Price Index, limited to a maximum of 3.0%, beginning on July 1. All retirees, disabled retirees and beneficiaries who have been receiving benefit payments for at least one year as of July 1 are eligible for the adjustment. The maximum amount of pension benefit subject to a COLA is \$14,000. All COLAs granted to members after 1981 and prior to July 1, 1998 are deemed to be an obligation of the Commonwealth of Massachusetts and are not the liability of the Retirement System.	
Optional Forms of Payment	A member may elect to receive his or her retirement allowance, payable in monthly installments, in one of three forms of payment: <ul style="list-style-type: none">◆ Option A – Total annual allowance commencing at retirement and terminating at member's death.◆ Option B – A reduced annual allowance commencing at retirement with death benefit equal to excess of member contributions plus credited interest to retirement over annuity benefit paid to member.◆ Option C – A reduced annual allowance commencing at retirement with 66⅔% of benefit continued to designated beneficiary upon death of member. For members who retired on or after January 12, 1988, if the beneficiary pre-deceases the retiree, the benefit payable increases based on the factor used to determine the Option C benefit at retirement. For members who retired prior to January 12, 1988, if the System has accepted Section 288 of Chapter 194 of the Acts of 1998 and the beneficiary pre-deceases the retiree, the benefit payable increases based on the factor used to determine the Option C benefit at retirement.	

SECTION 6 - ACTUARIAL ASSUMPTIONS AND METHODS

Valuation Date January 1, 2020

Investment Return 7.50% per year.
 The investment return assumption is a long-term assumption based on capital market expectations by asset class, historical returns and professional judgment. We considered analysis prepared by PRIM's investment advisor using a building block approach and using the target asset allocation, expected returns by asset class and risk analysis to determine a long-term expected average annual rate of return.

Annuity Savings Fund Interest Rate 2.00% per year

Amortization Method *Unfunded Actuarial Accrued Liability (UAL):*
 Increasing dollar amount at 4% to reduce the Unfunded Actuarial Accrued Liability to zero on or before June 30, 2031.

Early Retirement Incentive Program (ERI) for 2002:
 Increasing dollar amount at 4.5% to reduce the Unfunded Actuarial Accrued Liability attributable to the 2002 ERI to zero on or before June 30, 2028.

Early Retirement Incentive Programs (ERI) for 2003:
 Increasing dollar amount at 4.5% to reduce the Unfunded Actuarial Accrued Liability attributable to the 2003 ERI to zero on or before June 30, 2028.

For fiscal years 2022 through 2024, the appropriation is limited to an annual increase of 6.1% and for fiscal years 2025 and beyond, the appropriation is limited to an annual increase of 6.6%.

Salary Scale The assumed annual rates for salary increases including longevity are illustrated by the following rates:

Years of Service	Groups 1 and 2	Group 4
0	6.00%	7.00%
1	5.50%	6.50%
2	5.50%	6.00%
3	5.25%	5.75%
4	5.25%	5.25%
5	4.75%	5.25%
6	4.75%	4.75%
7	4.50%	4.75%
8	4.50%	4.75%
9+	4.25%	4.75%

The salary scale assumption is a long-term estimate derived from historical data, current and recent market expectations and professional judgment.

SECTION 6 - ACTUARIAL ASSUMPTIONS AND METHODS

Cost-of-Living Allowance

Cost-of-Living Allowances (COLA) are assumed to be 3% of the pension amount, capped at \$420 per year.

Mortality Rates

RP-2014 Blue Collar Mortality Table with full generational mortality improvement using Scale MP-2018. For disabled members, RP-2014 Blue Collar Mortality Table set forward one year with full generational mortality improvement using Scale MP-2018.

General Employees: 55% of deaths are job-related.

Police and Fire : 90% of deaths are job-related.

PERAC completed a local system retiree mortality study in 2019 and selected the RP-2014 Blue Collar Mortality Table with full generational mortality improvement using Scale MP-2018. The underlying tables with generational mortality improvement selected reasonably reflect the mortality experience of the System as of the valuation date based on historical and current demographic data as well as professional judgement.

Turnover Rates

Illustrative turnover rates are shown below:

Creditable Service	Groups 1 and 2	Group 4
0	0.1500	0.0150
10	0.0540	0.0150
20	0.0200	0.0000
30	0.0000	0.0000

Disability Rates

Illustrative disability rates are shown below:

Attained Age	Groups 1 and 2	Group 4
20	0.0001	0.0010
30	0.0003	0.0030
40	0.0010	0.0030
50	0.0019	0.0125
60	0.0028	0.0085

General Employees: 55% of disabilities are accidental and 45% are ordinary.

Police and Fire : 90% of disabilities are accidental and 10% are ordinary.

SECTION 6 - ACTUARIAL ASSUMPTIONS AND METHODS

Retirement Rates

Illustrative retirement rates are shown below:

Attained Age	Groups 1 and 2		Group 4
	Male	Female	Male & Female
50	0.0100	0.0150	0.0200
51	0.0100	0.0150	0.0200
52	0.0100	0.0200	0.0200
53	0.0100	0.0250	0.0500
54	0.0200	0.0250	0.0750
55	0.0200	0.0550	0.1500
56	0.0250	0.0650	0.1000
57	0.0250	0.0650	0.1000
58	0.0500	0.0650	0.1000
59	0.0650	0.0650	0.1500
60	0.1200	0.0500	0.2000
61	0.2000	0.1300	0.2000
62	0.3000	0.1500	0.2500
63	0.2500	0.1250	0.2500
64	0.2200	0.1800	0.3000
65	0.4000	0.1500	1.0000
66	0.2500	0.2000	1.0000
67	0.2500	0.2000	1.0000
68	0.3000	0.2500	1.0000
69	0.3000	0.2000	1.0000
70	1.0000	1.0000	1.0000

The turnover, disability and retirement rates are based on PERAC's most recent experience analysis of local retirement systems which reviewed age, gender and job group. The assumptions reflect this analysis as well as professional judgment.

Actuarial Cost Method

Individual Entry Age Normal.

Actuarial Asset Method

The Actuarial Value of Assets is the market value of assets as of the valuation date reduced by the sum of:

- a) 80% of gains and losses of the prior year,
- b) 60% of gains and losses of the second prior year,
- c) 40% of gains and losses of the third prior year, and
- d) 20% of gains and losses of the fourth prior year.

Investment gains and losses are determined by the excess or deficiency of the expected return over the actual return on the market value. The actuarial valuation of assets is further constrained to be not less than 80% or more than 120% of market value.

SECTION 6 - ACTUARIAL ASSUMPTIONS AND METHODS

Census Data	Census data as of the valuation date were submitted by the Retirement Board.
Asset Data	Asset information is reported annually to the Public Employee Retirement Administration Commission by the Dukes County Contributory Retirement Board.
Dependents	80% of all members will be survived by a spouse. Age assumption for spouses is that males are assumed to be three years older than females.
Net Section 3(8)(c) Transfers	Reimbursements paid to and received from other retirement systems for that portion of a retiree's pension that is based on service earned in another retirement system. Net 3(8)(c) transfers are assumed to be \$400,000 per year.
Administrative Expenses	<p>The anticipated administrative expenses for the fiscal year. For Fiscal Year 2021, the administrative expenses were assumed to be \$400,000 and are anticipated to increase 3.5% per year.</p> <p>The administrative expense assumption is based on information relating to the System's administrative expenses provided by the Retirement System.</p>

SECTION 7 - PLAN MEMBER INFORMATION

Exhibit 7.1 - Summary of Census Data as of January 1, 2020

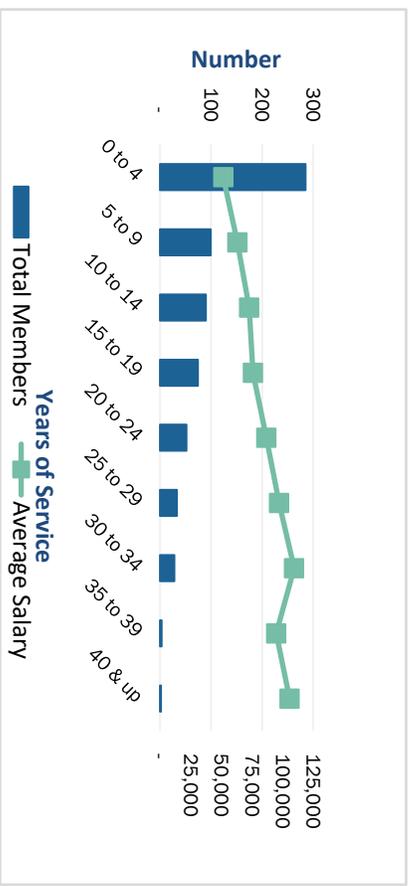
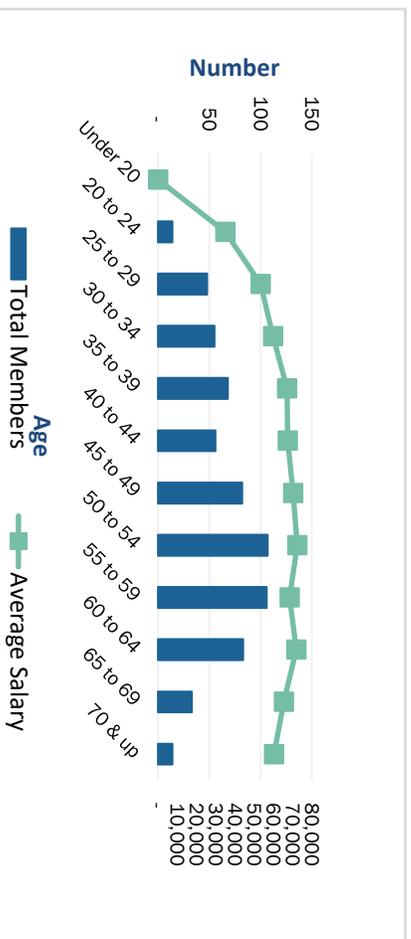
Census data as of December 31, 2019 was provided to us by the Retirement Board. We performed edits on the data to ensure that it is reasonable and complete and made certain assumptions regarding any missing or invalid data so that results are not materially affected. Presented on the following pages are summaries of the demographic profile of active members (Exhibit 7.2) and retired plan members and beneficiaries and disabled plan members (Exhibit 7.3). Below, we present a comparison of the census data from the current and prior valuations:

Valuation Date	January 1, 2020	January 1, 2018	% Change
Census Data			
Active Members	666	666	0.0%
Average Age	48.7	49.2	(1.0%)
Average Service	10.3	10.9	(5.6%)
Valuation Salary	\$44,437,598	\$41,262,496	7.7%
Average Salary	\$66,723	\$61,956	7.7%
Retired Members and Beneficiaries	338	293	15.4%
Average Age	71.7	71.6	0.1%
Total Annual Retirement Allowance	\$9,029,207	\$7,130,535	26.6%
Average Annual Retirement Allowance	\$26,714	\$24,336	9.8%
State Reimbursed COLAs	\$2,267	\$17,621	(87.1%)
Total System-Funded Retirement Allowance	\$9,026,940	\$7,112,914	26.9%
Disabled Members	31	26	19.2%
Average Age	63.1	62.1	1.6%
Total Annual Retirement Allowance	\$1,382,497	\$1,045,966	32.2%
Average Annual Retirement Allowance	\$44,597	\$40,229	10.9%
State Reimbursed COLAs	\$83	\$990	(91.6%)
Total System-Funded Retirement Allowance	\$1,382,414	\$1,044,976	32.3%
Inactive Members	238	188	26.6%
Annuity Savings Fund	\$3,293,244	\$2,283,407	44.2%

SECTION 7 - PLAN MEMBER INFORMATION

Exhibit 7.2 - Active Members by Age and Years of Service as of January 1, 2020

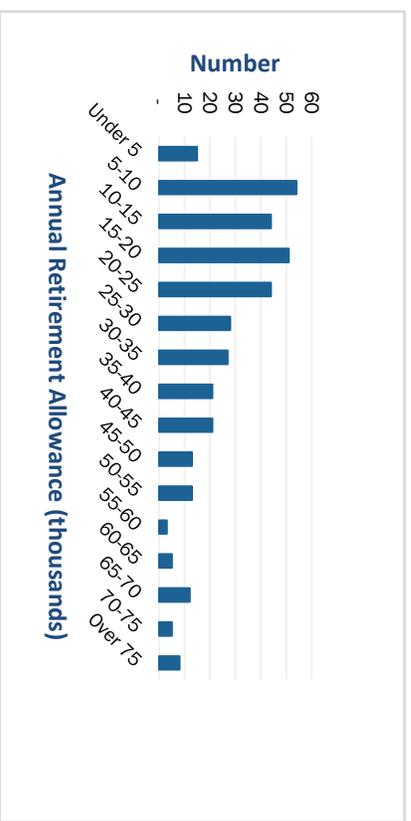
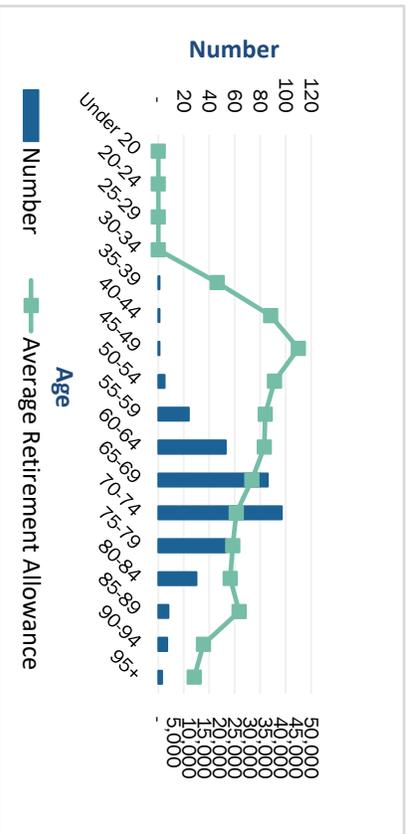
Attained Age	Years of Service											Total	Total Salary	Average Salary		
	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 & up							
Under 20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 to 24	14	-	-	-	-	-	-	-	-	-	-	-	-	14	491,113	35,079
25 to 29	43	5	-	-	-	-	-	-	-	-	-	-	-	48	2,564,507	53,427
30 to 34	38	15	2	-	-	-	-	-	-	-	-	-	-	55	3,286,590	59,756
35 to 39	33	20	12	3	-	-	-	-	-	-	-	-	-	68	4,568,046	67,177
40 to 44	26	9	11	8	2	-	-	-	-	-	-	-	-	56	3,778,969	67,482
45 to 49	27	12	16	11	9	7	-	-	-	-	-	-	-	82	5,757,013	70,207
50 to 54	33	19	16	14	11	6	8	-	-	-	-	-	-	107	7,748,889	72,420
55 to 59	42	10	16	14	6	8	10	-	-	-	-	-	-	106	7,260,563	68,496
60 to 64	17	7	10	14	14	8	7	1	2	-	-	-	-	83	5,976,394	72,005
65 to 69	9	2	5	6	5	3	2	1	1	-	-	-	-	33	2,160,434	65,468
70 & up	3	-	2	1	5	1	1	1	-	-	-	-	-	14	845,080	60,363
Total	285	99	90	74	52	33	28	3	2	666	44,437,598	66,723				
Average Salary	51,628	63,054	72,921	76,043	86,924	97,181	109,558	94,961	105,880							
	Average Age: 48.7															
	Average Service: 10.3															



SECTION 7 - PLAN MEMBER INFORMATION

Exhibit 7.3 - Annual Retirement Allowances as of January 1, 2020

Attained Age	Service Retirees		Disability Retirees		Beneficiaries	
	Number	Annual Retirement Allowance	Number	Annual Retirement Allowance	Number	Annual Retirement Allowance
Under 20	0	0	0	0	0	0
20-24	0	0	0	0	0	0
25-29	0	0	0	0	0	0
30-34	0	0	0	0	0	0
35-39	0	0	1	19,280	0	0
40-44	0	0	1	36,742	0	0
45-49	0	0	1	45,813	0	0
50-54	3	153,904	0	0	2	35,821
55-59	17	519,367	5	223,697	2	95,199
60-64	41	1,260,852	10	554,264	2	19,643
65-69	70	2,122,309	9	404,043	7	104,248
70-74	88	2,296,905	2	53,483	7	122,627
75-79	48	1,198,211	2	45,175	3	43,805
80-84	28	691,458	0	0	2	14,739
85-89	6	151,591	0	0	2	59,803
90-94	7	103,493	0	0	0	0
95+	1	4,335	0	0	2	30,897
Total	309	8,502,425	31	1,382,497	29	526,782
Average Age	71.5		63.1		72.8	
Average Retirement Allowance		27,516		44,597		18,165



SECTION 8 - GLOSSARY OF TERMS

Actuarial Accrued Liability – That portion of the Actuarial Present Value of pension plan benefits which is not provided by future Normal Costs or employee contributions. It is the portion of the Actuarial Present Value attributable to service rendered as of the Valuation Date.

Actuarial Assumptions – Assumptions, based upon past experience or standard tables, used to predict the occurrence of future events affecting the commencement, amount and duration of pension benefits, such as: changes in compensation, mortality, withdrawal, disablement and retirement; rates of investment earnings and asset appreciation or depreciation; and any other relevant items.

Actuarial Cost Method (or Funding Method) – A procedure for allocating the Actuarial Present Value of all past and future pension plan benefits to the current year (Normal Cost) and the past (Actuarial Accrued Liability).

Actuarial Gain or Loss (or Experience Gain or Loss) – A measure of the difference between actual experience and that expected based upon the set of Actuarial Assumptions, during the period between the valuation date and the most recent immediately preceding valuation date.

Actuarial Present Value – The dollar value on the valuation date of all benefits expected to be paid to current members based upon the Actuarial Assumptions and the terms of the Plan.

Amortization Payment – That portion of the pension plan appropriation which represents payments made to pay interest on and the reduction of the Unfunded Accrued Liability.

Annual Statement – The statement submitted by the local retirement board to PERAC each year that describes the asset holdings and Fund balances as of December 31 and the transactions during the calendar year that affected the financial condition of the retirement system.

Annuity Reserve Fund – The fund into which total accumulated Member Contributions, including interest, is transferred at the time a member retires, and from which annuity payments are made.

Annuity Savings Fund – The fund in which Member Contributions plus interest credited are held for active members and for former members who have not withdrawn their contributions and are not yet receiving a benefit (inactive members).

Assets – The total value of the investments held by the Plan trust that are for the payment of promised benefits. Employer appropriations and Member Contributions, as well as investment earnings, are added to the Plan trust. Benefit payments and other disbursements are withdrawn from the Plan trust. For valuation purposes, assets are usually measured at market value.

Cost of Benefits – The estimated payment from the pension system for benefits for the fiscal year.

Expense Fund – The fund into which the appropriation for administrative expenses is paid and from which all such expenses are paid.

SECTION 8 - GLOSSARY OF TERMS

Funded Ratio – The Actuarial Value of Assets expressed as a percentage of the Actuarial Accrued Liability.

Funding Schedule – The schedule based upon the most recently approved actuarial valuation which sets forth the amount which would be appropriated to the pension system in accordance with Section 22D and Section 22F of M.G.L. Chapter 32.

GASB – Governmental Accounting Standards Board.

Normal Cost – Total Normal Cost is that portion of the Actuarial Present Value of pension plan benefits which is expected to accrue in the current fiscal year. The Employee Normal Cost is the amount of the expected Member Contributions for the current fiscal year. The Employer Normal Cost is the difference between the Total Normal Cost and the Employee Normal Cost.

Pension Fund – The fund into which appropriation amounts as determined by PERAC are paid and from which pension benefits are paid.

Pension Reserve Fund – The fund which shall be credited with all amounts set aside by a system for the purpose of establishing a reserve to meet future pension liabilities. These amounts would include excess interest earnings.

Present Value of Future Benefits – The actuarial present value of the cost to finance benefits payable in the future, discounted to reflect the expected effects of the time value of money and the probabilities of payment.

Special Fund for Military Service Credit – The fund which is credited with amounts paid by the retirement board equal to the amount which would have been contributed by a member during a military leave of absence as if the member had remained in active service of the retirement board. In the event of retirement or a non-job related death, such amount is transferred to the Annuity Reserve Fund. In the event of termination prior to retirement or death, such amount shall be transferred to the Pension Fund.

Total Pension Liability – The portion of the Actuarial Present Value attributable to past service in accordance with the Entry Age cost method as stipulated by GASB Statement Number 67 (GASB 67).

Unfunded Actuarial Accrued Liability – The excess of the Actuarial Accrued Liability over the Actuarial Value of Assets.

SECTION 9 - MEMBER UNIT APPROPRIATION

Unit Name	FY2022 Appropriation						FY2021 Appropriation	Increase over 2021	Payment on 7/1/2021
	Actuarial Allocation Method								
	Normal Cost	Amortization of UAL	2002 ERI	2003 ERI	Net 3(c) Transfers	Total FY2022 Appropriation			
Up-Island School	74,313	160,130	3,136	-	16,760	254,339	235,577	249,823	
Dukes County	246,968	286,515	27,380	4,945	35,548	601,356	537,719	590,678	
Tisbury	477,575	829,653	47,987	-	79,165	1,434,380	1,309,078	1,408,909	
Edgartown	587,647	1,187,396	34,800	22,673	102,833	1,935,349	1,826,667	1,900,982	
Oak Bluffs	460,787	757,915	23,193	9,841	65,036	1,316,772	1,304,770	1,293,390	
West Tisbury	206,574	316,354	12,719	6,164	29,295	571,106	562,106	560,965	
Chilmark	234,340	231,348	16,072	8,510	13,840	504,110	380,655	495,158	
Aquinnah	94,869	101,534	-	-	7,158	203,561	205,964	199,946	
Gosnold	24,516	22,795	-	-	1,419	48,730	36,907	47,865	
MV Transit Authority	6,540	39,373	-	-	1,363	47,276	63,459	46,437	
MV Regional School	306,526	346,362	21,569	-	32,109	706,566	689,599	694,019	
MV Landbank	11,077	71,256	-	6,235	2,156	90,724	94,010	89,113	
MV Refuse	28,865	64,671	-	-	2,157	95,693	95,140	93,994	
MV Commission	41,133	87,293	-	6,141	6,572	141,139	148,865	138,633	
OB Water Dept	18,132	55,832	-	-	1,881	75,845	74,937	74,498	
Retirement System	1,967	(4,675)	-	-	2,708	-	-	-	
Total	2,821,829	4,553,752	186,856	64,509	400,000	8,026,946	7,565,453	6.10%	7,884,410

SECTION 9 - MEMBER UNIT APPROPRIATION

Unit Name	FY2023 Appropriation							Increase over 2022	Payment on 7/1/2022
	Actuarial Allocation Method				Net 3(c) Transfers	Total FY2023 Appropriation	FY2022 Appropriation		
	Normal Cost	Amortization of UAL	2002 ERI	2003 ERI					
Up-Island School	76,914	173,436	3,277	-	13,742	267,369	254,339	262,621	
Dukes County	255,611	310,271	28,613	5,168	25,264	624,927	601,356	613,830	
Tisbury	494,290	898,593	50,146	-	71,450	1,514,479	1,434,380	1,487,586	
Edgartown	608,214	1,286,135	36,367	23,694	103,387	2,057,797	1,935,349	2,021,256	
Oak Bluffs	476,915	820,924	24,236	10,284	66,401	1,398,760	1,316,772	1,373,922	
West Tisbury	213,804	342,642	13,291	6,441	27,886	604,064	571,106	593,338	
Chilmark	242,542	250,581	16,795	8,893	20,393	539,204	504,110	529,629	
Aquinnah	98,190	109,975	-	-	8,986	217,151	203,561	213,295	
Gosnold	25,374	24,689	-	-	1,971	52,034	48,730	51,110	
MV Transit Authority	6,769	42,659	-	-	3,414	52,842	47,276	51,904	
MV Regional School	317,254	375,124	22,540	-	30,486	745,404	706,566	732,168	
MV Landbank	11,465	77,204	-	6,515	6,396	101,580	90,724	99,776	
MV Refuse	29,876	70,063	-	-	5,558	105,497	95,693	103,624	
MV Commission	42,573	94,557	-	6,417	7,913	151,460	141,139	148,771	
OB Water Dept	18,767	60,489	-	-	4,765	84,021	75,845	82,529	
Retirement System	2,035	(4,023)	-	-	1,988	-	-	-	
Total	2,920,593	4,933,319	195,265	67,412	400,000	8,516,589	8,026,946	8,365,359	

SECTION 10 - RESULTS BY MEMBER UNIT

Member Unit	Up-Island						
	School	Dukes County	Tisbury	Egartown	Oak Bluffs	West Tisbury	
Summary of Member Data							
Groups 1 & 2	Active Members	35	24	93	111	82	28
	Average Age	45.5	48.4	50.6	50.3	48.7	53.2
	Average Service Salary	6.4	7.0	10.8	11.4	9.6	11.1
Group 4	Average Service Salary	1,534,320	2,268,941	5,395,069	6,757,317	4,586,478	1,854,106
	Average Salary	43,838	94,539	58,011	60,877	55,933	66,218
	Retired Members and Beneficiaries	20	26	68	68	55	22
Disabled Members	Annual Pensions	336,900	715,887	1,919,770	2,263,239	1,296,476	762,521
	Average Age	68.7	73.1	71.8	71.6	71.5	71.4
	Average Pension	16,845	27,534	28,232	33,283	23,572	34,660
Inactive Members	Annual Pensions	99,348	209,405	140,846	413,419	396,372	0
	Average Age	60.5	63.3	58.5	64.0	62.7	0.0
	Average Pension	49,674	34,901	35,212	59,060	44,041	0
Annuity Savings Fund	Annual Pensions	212,046	51,407	626,422	705,065	608,693	99,897
	Average Pension	35	10	36	30	57	7

SECTION 10 - RESULTS BY MEMBER UNIT

Member Unit	Up-Island						West Tisbury
	School	Dukes County	Tisbury	Egartown	Oak Bluffs		
Actuarial Accrued Liability - January 1, 2020							
Active Employees	2,412,897	4,822,227	18,015,209	28,346,983	17,859,042	7,398,243	
Retired Members and Beneficiaries	3,700,317	7,182,124	19,773,580	22,959,377	13,496,530	7,958,793	
Disabled Members	1,197,376	2,427,407	1,654,866	4,921,399	4,626,695	0	
Inactive Members	212,046	51,407	626,422	705,065	608,693	99,897	
Total	7,522,636	14,483,165	40,070,077	56,932,824	36,590,960	15,456,933	
Actuarial Value of Plan Assets - January 1, 2020							
Actuarial Value of Assets	5,885,701	11,331,610	31,350,776	44,544,168	28,628,720	12,093,484	
Unfunded Actuarial Accrued Liability							
Unfunded Actuarial Accrued Liability	1,616,293	2,938,779	8,403,437	12,010,351	7,744,800	3,239,160	
ERI 2002	20,642	180,226	315,864	229,068	152,662	83,719	
ERI 2003	0	32,550	0	149,237	64,778	40,570	
Total	1,636,935	3,151,555	8,719,301	12,388,656	7,962,240	3,363,449	
Normal Cost - January 1, 2020							
Total Normal Cost	204,315	496,327	1,069,445	1,415,120	1,061,373	441,197	
Administrative Expenses	11,867	28,828	62,116	82,193	61,647	25,626	
Total Normal Cost	216,182	525,155	1,131,561	1,497,313	1,123,020	466,823	
Employee Normal Cost	(148,162)	(299,100)	(694,426)	(959,426)	(701,251)	(277,741)	
Employer Normal Cost	68,020	226,055	437,135	537,887	421,769	189,082	
Employer Normal Cost as % of Salary	4.43%	7.17%	6.09%	5.38%	5.84%	6.76%	

SECTION 10 - RESULTS BY MEMBER UNIT

Member Unit	Up-Island School	Dukes County	Tisbury	Egartown	Oak Bluffs	West Tisbury
2021 Appropriation						
Non-ERI Appropriation	232,576	506,786	1,263,158	1,771,668	1,273,159	544,037
ERI 2002	3,001	26,201	45,920	33,303	22,194	12,171
ERI 2003	0	4,732	0	21,696	9,417	5,898
Total Appropriation	235,577	537,719	1,309,078	1,826,667	1,304,770	562,106
2022 Appropriation						
Employer Normal Cost	74,313	246,968	477,575	587,647	460,787	206,574
Amortization Payment of UAL	159,187	284,285	824,332	1,180,217	753,031	314,236
ERI 2002	3,136	27,380	47,987	34,800	23,193	12,719
ERI 2003	0	4,945	0	22,673	9,841	6,164
Net 3(8)(c) Transfers	16,760	35,548	79,165	102,833	65,036	29,295
Total Appropriation (before adjustment)	253,396	599,126	1,429,059	1,928,170	1,311,888	568,988
Adjusted Appropriation	943	2,230	5,321	7,179	4,884	2,118
Total Appropriation	254,339	601,356	1,434,380	1,935,349	1,316,772	571,106
2022 Appropriation Increase over 2021	7.96%	11.83%	9.57%	5.95%	0.92%	1.60%
2023 Appropriation						
Actuarial Allocation Method:						
Employer Normal Cost	76,914	255,611	494,290	608,214	476,915	213,804
Amortization Payment of UAL	172,456	307,981	893,043	1,278,594	815,798	340,428
ERI 2002	3,277	28,613	50,146	36,367	24,236	13,291
ERI 2003	0	5,168	0	23,694	10,284	6,441
Net 3(8)(c) Transfers	13,742	25,264	71,450	103,387	66,401	27,886
Total Appropriation (before adjustment)	266,389	622,637	1,508,929	2,050,256	1,393,634	601,850
Adjusted Appropriation	980	2,290	5,550	7,541	5,126	2,214
Total Appropriation	267,369	624,927	1,514,479	2,057,797	1,398,760	604,064
2023 Appropriation Increase over 2022	5.51%	4.31%	5.98%	6.72%	6.62%	6.16%

SECTION 10 - RESULTS BY MEMBER UNIT

Member Unit	Chilmark	Aquinnah	Gosnold	MV Transit Authority	MV Regional School
Summary of Member Data					
Active Members	24	11	6	8	95
Average Age	55.0	49.3	61.3	43.0	50.0
Groups 1 & 2 Average Service Salary	12.1	6.5	15.6	11.4	6.6
Average Salary	1,640,346	593,362	255,773	611,223	4,677,116
	68,348	53,942	42,629	76,403	49,233
Active Members	12	4	0	0	0
Average Age	42.4	49.8	0.0	0.0	0.0
Group 4 Average Service Salary	9.1	21.3	0.0	0.0	0.0
Average Salary	1,113,831	472,456	0	0	0
	92,819	118,114	0	0	0
Retired Members and Beneficiaries	17	6	4	1	36
Annual Pensions	360,249	134,916	36,929	35,473	764,069
Average Age	71.4	71.1	77.1	70.9	71.5
Average Pension	21,191	22,486	9,232	35,473	21,224
Disabled Members	0	1	0	0	2
Annual Pensions	0	51,404	0	0	71,703
Average Age	0.0	66.9	0.0	0.0	71.1
Average Pension	0	51,404	0	0	35,851
Inactive Members	8	3	0	4	43
Annuity Savings Fund	240,484	85,348	0	124,186	474,510

SECTION 10 - RESULTS BY MEMBER UNIT

Member Unit	Chilmark	Aquinnah	Gosnold	MV Transit Authority	MV Regional School
Actuarial Accrued Liability - January 1, 2020					
Active Employees	7,385,844	2,824,448	730,044	1,358,571	7,744,320
Retired Members and Beneficiaries	3,882,338	1,393,993	335,288	362,514	8,181,917
Disabled Members	0	553,031	0	0	729,298
Inactive Members	240,484	85,348	0	124,186	474,510
Total	11,508,666	4,856,820	1,065,332	1,845,271	17,130,045
Actuarial Value of Plan Assets - January 1, 2020					
Actuarial Value of Assets	9,004,365	3,799,970	833,514	1,443,738	13,402,525
Unfunded Actuarial Accrued Liability					
Unfunded Actuarial Accrued Liability	2,342,493	1,056,850	231,818	401,533	3,585,545
ERI 2002	105,791	0	0	0	141,975
ERI 2003	56,017	0	0	0	0
Total	2,504,301	1,056,850	231,818	401,533	3,727,520
Normal Cost - January 1, 2020					
Total Normal Cost	468,802	182,306	44,200	64,664	686,711
Administrative Expenses	27,229	10,589	2,567	3,756	39,886
Total Normal Cost	496,031	192,895	46,767	68,420	726,597
Employee Normal Cost	(281,534)	(106,059)	(24,327)	(62,434)	(446,027)
Employer Normal Cost	214,497	86,836	22,440	5,986	280,570
Employer Normal Cost as % of Salary	7.79%	8.15%	8.77%	0.98%	6.00%

SECTION 10 - RESULTS BY MEMBER UNIT

Member Unit	Chilmark	Aquinnah	Gosnold	MV Transit Authority	MV Regional School
2021 Appropriation					
Non-ERI Appropriation	357,131	205,964	36,907	63,459	668,959
ERI 2002	15,380	0	0	0	20,640
ERI 2003	8,144	0	0	0	0
Total Appropriation	380,655	205,964	36,907	63,459	689,599
2022 Appropriation					
Employer Normal Cost	234,340	94,869	24,516	6,540	306,526
Amortization Payment of UAL	229,478	100,779	22,614	39,198	343,741
ERI 2002	16,072	0	0	0	21,569
ERI 2003	8,510	0	0	0	0
Net 3(8)(c) Transfers	13,840	7,158	1,419	1,363	32,109
Total Appropriation (before adjustment)	502,240	202,806	48,549	47,101	703,945
Adjusted Appropriation	1,870	755	181	175	2,621
Total Appropriation	504,110	203,561	48,730	47,276	706,566
2022 Appropriation Increase over 2021	32.43%	-1.17%	32.03%	-25.50%	2.46%
2023 Appropriation					
Actuarial Allocation Method:					
Employer Normal Cost	242,542	98,190	25,374	6,769	317,254
Amortization Payment of UAL	248,605	109,179	24,498	42,465	372,392
ERI 2002	16,795	0	0	0	22,540
ERI 2003	8,893	0	0	0	0
Net 3(8)(c) Transfers	20,393	8,986	1,971	3,414	30,486
Total Appropriation (before adjustment)	537,228	216,355	51,843	52,648	742,672
Adjusted Appropriation	1,976	796	191	194	2,732
Total Appropriation	539,204	217,151	52,034	52,842	745,404
2023 Appropriation Increase over 2022	7.36%	7.07%	7.18%	12.19%	5.89%

SECTION 10 - RESULTS BY MEMBER UNIT

Member Unit	MV Landbank	MV Refuse	MV Commission	OB Water Dept	Retirement System	Total
Summary of Member Data						
Active Members	9	9	10	9	2	556
Average Age	47.0	51.2	51.4	52.0	45.9	50.0
Groups 1 & 2	15.1	15.3	13.5	14.5	16.5	9.9
Average Service Salary	824,543	666,339	882,775	637,135	182,165	33,367,008
Average Salary	91,616	74,038	88,278	70,793	91,083	60,013
Active Members	0	0	0	0	0	110
Average Age	0.0	0.0	0.0	0.0	0.0	42.1
Average Service Salary	0.0	0.0	0.0	0.0	0.0	12.3
Group 4	0	0	0	0	0	11,070,590
Average Salary	0	0	0	0	0	100,642
Retired Members and Beneficiaries	2	3	6	2	2	338
Annual Pensions	56,129	56,139	171,052	48,961	70,498	9,029,207
Average Age	67.7	71.4	73.1	75.4	75.7	71.7
Average Pension	28,064	18,713	28,509	24,480	35,249	26,714
Disabled Members	0	0	0	0	0	31
Annual Pensions	0	0	0	0	0	1,382,497
Average Age	0.0	0.0	0.0	0.0	0.0	63.1
Average Pension	0	0	0	0	0	44,597
Inactive Members	0	3	0	2	0	238
Annuity Savings Fund	0	60,011	0	5,175	0	3,293,244

SECTION 10 - RESULTS BY MEMBER UNIT

Member Unit	MV Landbank	MV Refuse	MV Commission	OB Water Dept	Retirement System	Total
Actuarial Accrued Liability - January 1, 2020						
Active Employees	2,813,653	2,371,527	2,352,210	2,081,594	539,249	109,056,061
Retired Members and Beneficiaries	643,196	572,555	1,924,928	488,918	535,391	93,391,759
Disabled Members	0	0	0	0	0	16,110,072
Inactive Members	0	60,011	0	5,175	0	3,293,244
Total	3,456,849	3,004,093	4,277,138	2,575,687	1,074,640	221,851,136
Actuarial Value of Plan Assets - January 1, 2020						
Actuarial Value of Assets	2,704,634	2,350,398	3,346,427	2,015,214	840,797	173,576,041
Unfunded Actuarial Accrued Liability						
Unfunded Actuarial Accrued Liability	711,174	653,695	890,289	560,473	233,843	46,620,533
ERI 2002	0	0	0	0	0	1,229,947
ERI 2003	41,041	0	40,422	0	0	424,615
Total	752,215	653,695	930,711	560,473	233,843	48,275,095
Normal Cost - January 1, 2020						
Total Normal Cost	87,606	86,665	120,813	75,203	19,505	6,524,252
Administrative Expenses	5,088	5,034	7,017	4,368	1,133	378,944
Total Normal Cost	92,694	91,699	127,830	79,571	20,638	6,903,196
Employee Normal Cost	(82,555)	(65,278)	(90,180)	(62,974)	(18,838)	(4,320,312)
Employer Normal Cost	10,139	26,421	37,650	16,597	1,800	2,582,884
Employer Normal Cost as % of Salary	1.23%	3.97%	4.26%	2.60%	0.99%	5.81%

SECTION 10 - RESULTS BY MEMBER UNIT

Member Unit	MV Landbank	MV Refuse	MV Commission	OB Water Dept	Retirement System	Total
2021 Appropriation						
Non-ERI Appropriation	88,043	95,140	142,988	74,937	0	7,324,912
ERI 2002	0	0	0	0	0	178,810
ERI 2003	5,967	0	5,877	0	0	61,731
Total Appropriation	94,010	95,140	148,865	74,937	0	7,565,453
2022 Appropriation						
Employer Normal Cost	11,077	28,865	41,133	18,132	1,967	2,821,829
Amortization Payment of UAL	70,920	64,316	86,770	55,551	25,097	4,553,752
ERI 2002	0	0	0	0	0	186,856
ERI 2003	6,235	0	6,141	0	0	64,509
Net 3(8)(c) Transfers	2,156	2,157	6,572	1,881	2,708	400,000
Total Appropriation (before adjustment)	90,388	95,338	140,616	75,564	29,772	8,026,946
Adjusted Appropriation	336	355	523	281	(29,772)	0
Total Appropriation	90,724	95,693	141,139	75,845	0	8,026,946
2022 Appropriation Increase over 2021	-3.50%	0.58%	-5.19%	1.21%	0.00%	6.10%
2023 Appropriation						
Actuarial Allocation Method:						
Employer Normal Cost	11,465	29,876	42,573	18,767	2,035	2,920,593
Amortization Payment of UAL	76,832	69,676	94,002	60,181	27,189	4,933,319
ERI 2002	0	0	0	0	0	195,265
ERI 2003	6,515	0	6,417	0	0	67,412
Net 3(8)(c) Transfers	6,396	5,558	7,913	4,765	1,988	400,000
Total Appropriation (before adjustment)	101,208	105,110	150,905	83,713	31,212	8,516,589
Adjusted Appropriation	372	387	555	308	(31,212)	0
Total Appropriation	101,580	105,497	151,460	84,021	0	8,516,589
2023 Appropriation Increase over 2022	12.38%	10.66%	7.71%	11.19%	0.00%	6.10%